

# AMERICAN VETERINARY REVIEW.

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## EDITORIAL.

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### EUROPEAN CHRONICLES.

PARIS, January 15, 1912.

A STUDY IN COMPARATIVE PATHOLOGY.—A primitive sarcoma of the right frontal lobe complicated with fatal perineoplastic softening in a horse has been the occasion for a magistral article in the *Recueil de Medecine Veterinaire* by Prof. G. Petit, Dr. Marchand and Major Berton, Army Veterinarians.

"The symptomatology of cerebral tumors in animals is yet so little known that often the diagnosis is undecided and post mortem alone makes it possible to establish the seat and the nature of the lesions. This difficulty of diagnosis has several causes. Compared to the human brain, that of the horse has a relatively simply function. The intellectual symptoms, the signs of localization, the convulsive troubles do not present positive character, or, at best, are these only outlined. The general symptoms of cerebral tumors, so frequent in man, consisting of headaches, easy vomitings, constipation, are not recognized or observed in animals. The brain of the horse is much smaller than that of man, and a malignant tumor may perhaps grow bigger and invade more tissue, more rapidly, hence the exhibition of symptoms indicating rather a diffuse more than a localized lesion.

"Notwithstanding the general progress made in later years by the clinic of cerebral affections in man, it must be acknowledged that errors of diagnosis are still relatively frequent when one is in the presence of encephalic tumors, and there is nothing surprising for these errors to be more frequent in veterinary medicine. *There exists no grouping of symptoms, no pathognomonic syndromes of cerebral tumors.* The signs that they give rise to are met in the course of other diseases of the brain. There are even cases where the onset, evolution and termination of the disease are such that everything contributes to induce the practitioner in error. The following is an example:

"A seventeen-year-old artillery horse, good worker, has been generally healthy and given all satisfaction. One morning, being outdoors, *he suddenly drops—collapsed, so to speak—and remains about ten minutes, the legs flexed under the body, the nose resting on the ground, the head firmly flexed, the neck curved and the seat of strong, severe spasmodic contractions.* He got up abruptly, standing stiff with contraction of all the muscles—neck stiff, elevated; tail straight; legs moving all as if in one piece. The body is covered with profuse perspiration. Taken to his stable, and well rubbed, his condition is much improved. The horse is quieter. The respiration and circulation are about normal. The temperature  $38.4^{\circ}$  Conjunctivæ a little congested; pupils reflex is normal; no alteration of the fundus oculi. Appetite is fair. The animal moves slowly, but about normal. Lumbar reflex absent. Pricking with sharp needles for dysesthenic regions are not well marked. This condition lasted for 24 hours. The next morning appear series of paroxysms, which follow each other rapidly. *The animal has unrelaxing, sturdy falls, makes sudden jumps forward or sideways and exhibits general or local contractions.* He assumes most unusual positions; he rears up half way, sustained by a wall, with his feet in the manger, or again with his neck bent to the right and the chin resting on the shoulder. Keeping these peculiar attitudes during the day, towards evening he drops once more, is unable to get up, seems to be taken with paraplegia, and dies.

"At the post mortem no meningitis was detected. The cephalo-rachidian fluid was clear, citrine in color and in small quantity. The cerebellum is slightly congested. On the *anterior third of the right cerebral hemisphere* there are fine *hemorrhagic spots*. The brain has a grayish tint and is soft in consistency. A transversal section of both hemispheres shows that the lateral ventricles are normal, *but in the white substance of the right frontal lobe there are deep alterations, tumors like*. The white substance is softened, difficult to cut. It is amber-colored, *with fine petechias*. The bulb and cervical marrow was normal. The histological examination revealed the true nature of the neoplasm; it was a sarcoma.

"This observation is instructive, showing as it does that a *cerebral tumor may remain latent for a long time and suddenly, abruptly manifest itself by an apoplectic or epileptiformictus, without clear localized symptoms.*"

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AN ADDITION TO OPHTHALMIC VETERINARY SURGERY.—If not in use in veterinary medicine, the puncture of the sphenoidal sinuses, so as to empty them of their contents, has been already performed in human surgery, where cases of suppurative sphenoidal sinusitis have been observed.

Lieutenant H. J. Constant Thomassen, professor at the Royal Military School of Breda, has in the *Revue Generale* of Leclainche called attention to the indications that might be seen in horses and to the operation as he has performed it.

Suppuration of these cavities, whatever may have been its cause, will have for result neuritis of the optic nerve and amaurosis, and complete atrophy of the nerve may follow. Such, at least, seems to have been the condition of the cases spoken of by Lieutenant Thomassen.

The first case was in a mare which had had for some time double biocular amaurosis, of unknown origin, and to all appearance sudden in its manifestations. She was entirely blind, the eyes fixed and stiff in their motions, pupils dilated, the papilla of

the globe atrophied and the retinal veins dilated. The animal was destroyed. At the autopsy both optic nerves were found atrophied. The sphenoidal sinus was filled with orange-colored fluid. The opening of communication between it and the maxillary sinus was closed with polyp granulations.

The second case was again a mare which had had a cough and a nasal discharge for which she had been treated and had been able to resume work. One morning it is noticed that she seems to be fearful and hesitating in her actions. Turned out loose among others, she hesitates in walking, stops near another horse, which kicks her. She stands still, and when examined she is found completely blind. She has also exophthalmic paralysis of the muscles of the orbit. With the ophthalmoscope she shows the beginning of atrophy of the papilla, hyperhemia of the blood vessels. The discharge from the nose seems to be related to a sphenoidal sinusitis; compression of the optic nerves as well as that of those of motor muscles of the eye are suspected. Puncture of the sinus is decided.

After waiting a few days, when then the complete atrophy of the papilla of both eyes has progressed and is well marked; and of course restoration of the sight is beyond hope.

The animal is anesthetized with morphine and chloral, tracheotomy is performed in the middle of the neck and the laryngeal region well disinfested, an incision is made on the median line, the larynx is open, as in Williams' operation for roaring, and anesthetized with cocaine. An electric lamp permits the examination of the part, exposing well the "fornix pharyngis" and the openings of the two Eustachian tubes. Between these two a trocar, that invented by Vermeulen of Utrecht, which is used in man, is pushed through the bone with a little hammering, entered the cavity of the sinus and gave escape to a certain quantity of fluid. There was no bad sequelæ, and after a few days the animal had entirely recovered from the effects of the operation. On account of the advanced atrophy of the nerves, and no chance of recovery from the amaurosis, the animal was afterwards destroyed. At the post mortem it was observed that the opening of

the trocar had been too small and that the collection of fluid had returned.

The conclusions of Lieutenant Thomassen, after giving the above facts, are that: "Amaurosis of one or both eyes may be caused by sphenoidal sinusitis and that, on account of the small risk attached to the operation and the great danger of blindness, one must not hesitate to open the sphenoidal sinus as soon as such diseased state is about suspected." But certainly the examination of the condition of the eye with the ophthalmoscope and the degree of atrophy of the papilla must decide as to the proper indications for the interference.

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EXTENSIVE LOCAL ANESTHESIA.—The subject of anesthesia is one always of great interest to surgeons. The number of the publications, of new researches, which relate to it, show that the interest is still existing and that the ideal method remains to be found. Most of these investigations, during the last few years, appear to have a tendency to diminish the use of general anesthesia by ether or chloroform inhalation. This method has indeed again been the object of discussions, perhaps sometimes exaggerated, although to-day we are better acquainted with its dangers and the accidents that may accompany its application. And to supplant it various processes have been proposed to either produce narcosis by other means or to realize the anesthesia of surfaces of the body, more or less wide, without entire loss of consciousness.

"After each anesthesia," says Dr. Lenormand, in *Un Mouvement Medical*, "which passed by various phases of ups and downs before it reached the place relatively modest that it occupies to-day in practice, we have seen proposed the mixed anesthesia by scopolamine, morphine-chloroform, that by rectal injection, by intravenous injection of ether, etc. None of these methods seem to seriously threaten the classic inhalation for general narcosis; their technical complexity, their insufficiency, their dangers will always present their generalization. They were inter-

esting attempts, perhaps liable to improvements, but will not be methods which will be accepted as of daily application.

With these new methods, however, the field of action of local anesthesia has been developed, and we are now far indeed from the hesitating and limited applications of the beginning.

The substitution of novocaine-adrenaline, which allows the use of much larger doses, has much contributed to the extension of the method. And specially that which has for object to bring the anesthetic in direct contact with the nervous trunks of a field of operation, producing more simply and more surely the insensibilization of a wide surface.

It is this extensive application that two German surgeons have put in practice recently. Drs. Hirschel and Kulenkampf have had simultaneously the idea of producing the complete analgesia of the entire upper extremity by novocainisation of the brachial plexus in man by methods which are relatively simple. The techniques consist in reaching the plexus by a single prick made through the skin and without previous incision. Hirschel makes its injection directly through the axilla. Kulenkampf reaches the nervous trunk by a puncture, above the clavicle, as it comes out of the interscalenus triangle. Hirschel has reported three cases of severe operations where this extensive anesthesia permitted him to amputate forearms. Kulenkampf has resorted to it in twenty-five cases of abscesses, wounds of the hands or forearm, fractures and amputation.

Of course it does not seem that this method of obtaining extensive local anesthesia may find its indication in our veterinary practice, but it is a progress in surgery which even to veterinary surgeons must be of some interest.

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URINARY POUCHES.—In human medicine this name is given to more or less developed sacciform cavities, developed at the expense of the coats of the urethra and where the urine collects and remains between evictions. Some are simple defects of conforma-

tion and of congenital origin; others are the result of accidental dilatation of the urethral walls.

When a permanent obstacle to the flow of urine occurs, such as a stricture of the urethra, a calculus or a foreign body, the rupture of the bladder takes place most fatally under the progressing pressure of the collected urine. However, and specially in youth, when the vesical muscular structure is very strong, it is possible for a spot of less resistance to exist, no more near the bladder, but on the course of urethra, and then under the influence of the pressure made by the urine above the obstacle, the urethral coats give way some, become distended beyond their limit of elasticity, do not retract any more, and then a pouch more or less developed is formed. In fact, one can almost presume of the case where the urinary pressure will overcome the resistance of the walls of the pouch, promotes its rupture and be followed by the infiltration of the peri-urethral cellular tissue and the formation of a chronic urinary abscess.

In man these accidents are extremely rare. Writers acknowledge that, if theoretically the formation of a urinary pouch is easy to explain, clinics have not demonstrated that strictures of the urethra are commonly the cause of urinary pouch. In veterinary medicine this lesion is still more rare, as, according to Professors Besnoit and Robin, it has not yet been recorded. And yet, in some species of animals, ruminants especially, the etiological conditions of the accidents are normally observed, such as the length, narrow dimensions and multiple flexuosities of the urethra, promoting urinary stagnation, or the deposits of calcareous concretions on the walls of the canal, or again the stopping of calculi.

The symptoms presented usually are well described by Professors Besnoit and Robin in the *Revue Veterinaire*, where they describe a case which was brought to their examination, viz., in a yearling bull, which had bad habits of masturbation, suffered with balanitis, which were followed by violent and severe colics, and a few days after a swelling on the perineum. It was then as big as the head, situated in the median line and ovoid in shape. It extended from the ischial arch above to the sigmoid flexure of the

penis below. It was painless and fluctuating. By gradual pressure a certain quantity of urine was squeezed out by the meatus and the tumor was reduced in size. There was a certain amount of incontinence. Once emptied, the tumor was soon filled again and reappeared little by little, and when it had reached a certain size a spontaneous stream of urine escaped. An explorative puncture revealed the true nature of the contents of the tumor.

The animal was not put under treatment, but destroyed. The post mortem will be found among the contents of the French Review of this month.

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NEOL.—The antiseptics which have been in use for years are now almost entirely ignored in most large hospitals. Phenic acid, corrosive sublimate, iodoform, formol, salol, boric and picric acid are now making room for *neol*, a new cicatrizing antiseptic, which most of our medical journals are referring to.

Neol is a persulphate sodico-potassic preparation of electrolytic origin and obtained by a new process. It gives off slowly but continuously oxygen and ozone. It is an aqueous fluid with an aromatic odor and a slightly acidulated taste. It mixes well with water, glycerine or alcoholic mixtures. It has no toxic properties and can be used in large doses with impunity. It has antimicrobial properties, due to developing ozone, and its antiseptic action is peculiarly efficacious. The developing ozone gives it also its keratoplastic properties by activating the proliferation of cells and regeneration of tissues. It has also analgesic and decongesting properties.

Powerful antiseptic, with rapid action, it finds its application in the treatment of rebellious suppurations.

It is a powerful cicatrizing agent, which in extensive burns gives rise rapidly to the development of cicatrizing epidermis.

It is a vasoconstrictor or decongesting agent, as is proved by the effects that are obtained in inflammatory cedemas. As to its analgesic properties, they are manifested almost immediately, a few seconds after its application. It is besides that lasting and sometimes permanent.

Neol has found in human medicine quite extensive application. As dressings for the treatment of burns, ulcerations, recent or old wounds. As simple local coatings in sore throats, stomatitis. As gargles, or again in the free washings of cavities, metritis, vaginitis or rhinitis.

It seems that the antiseptic properties of neol might find their application in veterinary medicine, but so far I have not heard of its use among veterinarians, yet it might be good to try, if ever it finds its way in America.

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**BIBLIOGRAPHY—DISEASES OF THE DOG AND THEIR TREATMENT.**—This is a most important addition to veterinary literature for English readers, students and practitioners. It is the translation, with special authorization from the original author, by *Doctor Alexander Glass, A.M., V.S.* (McGill University), of the classical work of *Dr. George Muller*. The translator is lecturer on canine pathology in the Veterinary Department of the University of Pennsylvania and the author professor and director of the clinic for small animals at the Veterinary High School at Dresden. With such titles the reader can be assured of the superior qualities of the book he has in his hands.

Not having had the opportunity of seeing the previous editions published of the work, I can only notice that this is the third edition, revised and enlarged. Another proof of the welcome it has already received.

In his preface Dr. A. Glass tells us of the additions that he has made and of the differences that he has introduced specially in the therapeutic portion of the German work. He firmly insists on the manner of preparing and administering drugs in as small doses as possible, "as it frequently happens that the excitement caused by the administration of large amounts of decoctions and infusions in nervous or highly bred animals does more harm than the original disease."

Dr. Muller, in his preface, tells of his endeavors to write a work for the requirements of the profession, of the care he has

taken to avoid speculative facts or hypothesis. The diagnosis has been given the most prominent place, and the author has endeavored to establish the symptoms with their relation to the disease and to confine their therapeutic treatment to a knowledge of normal and pathological anatomy and physiology."

It is indeed a good thing to read these two prefaces, and principally that of Dr. Muller, for if we throw a glance at the literature on the subject of canine pathology, it will be easy for one to convince himself that the book is truly filling a wanted need. English works since the days of Youatt, passing by those down to the days of Steel, Stonehenge, Blaine, Mayhew, Mills, Hill and many others, do but an incomplete justice to the modern state of this branch of our medicine. French works are far from having books on diseases of dogs which can compare with those that there are on the diseases of other animals. And, as far as I know, the old German work of Hertwig has passed long ago its stage of usefulness.

And if we consider the immense importance that canine pathology has taken in the last few years as a specialty by the many peculiar circumstances and changes that have occurred in this species of animals and in general practice of the veterinarian, and also by the important place which it is occupying in comparative medicine, we can without hesitancy say that in undertaking the work that is before us Dr. Glass has done the profession a great good, and that there is no doubt that *Diseases of Dogs* will really prove *the* book for students and practitioners. It is not so often that such publications are made. A minute and detailed consideration of this work is not possible with the space at my command. It covers nearly 500 pages, illustrated by 178 small plates in the text and 14 full-page plates, 7 of which are colored. The description of the diseases is made by the divisions of apparatus, digestion, respiration, circulation, etc., etc.

It is printed on quite thick paper, in handsome, easily reading type, and shows that the publisher, Alexander Eger, has been doing his best to add to the general value of the work.

We believe *Diseases of Dogs* is called to a grand success, and deserves it.

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BIBLIOGRAPHIC ITEMS.—We have received: Veterinary Notes of December, 1911, Parke, Davis & Co.; the Agricultural Journal of the Union of South Africa for November, containing the Treatment of Redwater in Cattle with Trypanblue, by Dr. Arnold Thisler; Nodular Disease of the Intestines of Cattle, by Walter Jowett, F.R.C.V.S., D.V.H.; Blackhead, a Disease of Young Turkeys, by the same.

From the Bureau of Animal Industry: Bulletin 142, Dourine of Horses, Its Cause and Suppression, by John R. Mohler, V.M.D., and Bulletin 137, on Anthrax, with Special Reference to the Production of Immunity, by C. T. Dawson, M.D., D.V.S.

American Veterinary Education and Its Problem, by Director V. A. Moore. A paper presented by the chairman of the Committee on Intelligence and Education of the A. V. M. Association at its annual meeting in Toronto, August, 1911. Powerful argument, worthy of its author.

A. L.

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#### FURTHER SOUND AND SUFFICIENT REASONS WHY EVERY VETERINARIAN IN THE UNITED STATES SHOULD SUPPORT THE UNITED STATES ARMY VETERINARY BILL.

The ignominiousness of the status of the veterinarians in the United States Army to-day, the predicament, disgraceful to the whole veterinary profession outside the army, in which the veterinarians within the army find themselves to-day, is dwelt upon in the brief written in defense of the bill, published in the January number of the REVIEW, under "The Present Status of Veterinarians." The neglect of the veterinarian by Congress is enough

to drive the profession to distraction, were it not for the invincibility which strengthens the hearts and empowers the minds of most of us. The painful and unbearable predicament of the veterinarian in the army is almost like a chronic, angry sore in the side of the profession in America. We cannot heal that sore, root out the cause, nor stand upright like men and equals of the other professions in the army, until, keenly feeling the disgrace of it, we rise, with the unified, organized strength of the profession, like one man, to remove it. The organized strength, the herculean power of a well-aroused national veterinary association, combined with about sixty state and other local veterinary associations, is at this hour at work as never before, driving the bill for the relief of the veterinarians in the United States Army through Congress.

What is the bill? What is its purpose? And what are the sound and sufficient reasons why you and each of you should support it?

The bill was also printed in the January number of the REVIEW, under the "Army Veterinary Department." It is short, but, unlike many hundreds of bills offered for the consideration of Congress, every syllable of this one is of the utmost value to the profession as a whole, a fact which the future, should the bill pass, will unfold; and it has crystallized within it the needs of the veterinary service of the army as they have been discovered as a result of the lessons drawn from thirty or forty years of the bitterness of defeat of army veterinary legislation and by the crucifying experiences of veterinarians within the army service itself.

What, now, is the purpose of the bill?

The War Department of the United States is the *only* war department of *any civilized country* which does not give official recognition to the veterinarian as a professional man. He is not, and cannot be, as things are at present, the official, social or professional equal of members of any other profession in the army, such as those of medicine (physicians), theology (chaplains), the dental (dentists), mechanical engineers. The veterinarian cannot claim such rights, whatever be the brilliance of his intellect, the fineness of his sensibilities or moral sense, the attractiveness

of his social nature or deportment, because there is no law granting him these rights and recognizing his fitness to meet on terms of absolute equality with those who otherwise would be his compeers. The dilatory tactics of Congress for over a quarter of a century in not granting this professional recognition to the veterinarian by statute has reacted on veterinarians in all walks of life outside the army. Contempt of the veterinarian in government circles tends to breed contempt of him everywhere. Of course the inequalities are groundless; there is no justice in the situation. But where there is no law conferring on the veterinarian privileges arising from protective rights and giving him proper, official, professional recognition, the assumption is that he must remain without justice until Congress comes to his aid. The purpose of the bill to consolidate the veterinary service in the United States Army and to increase its efficiency is to bring relief to the veterinarian and to cure the evils of veterinary life in the army as it is to-day. This can only be done by making veterinarians commissioned officers, in the same way as physicians, dentists, chaplains, engineers and those who are representatives of the law, the judge advocates, are commissioned officers in the army. For the purpose of giving veterinarians commissions in the army this bill is framed.

What are the sound and sufficient reasons why the bill should and will have the active support of every veterinarian? 1. It metes out justice to our profession in the army and clears up the bad condition in which the veterinarian is placed at present. 2. It removes the stigma which the embarrassing situation of the army veterinarian places on the profession as a whole. 3. It permits the members of our profession to advance as other professions advance in the army, to get recognition for work accomplished, and to be on a par with all.

If any veterinarian who *knows* these sound and sufficient reasons for giving his personal, steadfast and staunchest support to the army veterinary bill will not do it, we will be much mistaken. The grievances of the army veterinarians are *your* grievances. Place them before your representatives in Congress as such.

Refer to the bill as House Bill 16843. The measure has been introduced into Congress. The House Committee on Military Affairs is favorably impressed with it. Drive the bill through by besieging Congressmen in its favor. We can win in the present session of Congress if we work with a will. *Work will win.*

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COMMISSIONER PEARSON RESIGNS.—On page 771 of this issue of the REVIEW we have published a copy of the resignation of the Hon. Raymond A. Pearson from the position of Commissioner of Agriculture of the State of New York, and its acceptance by Governor Dix. Thirst for greater knowledge (which was also a characteristic of his late brother, Leonard Pearson, one of the greatest men the American veterinary profession has ever numbered in its ranks) is taking from the Empire State the fairest-minded, most efficient and best Commissioner of Agriculture that had ever filled that important office up to the time of his appointment by Governor Hughes in the spring of 1908. And he will be greatly missed, not only by the farmers and stockraisers, who had learned to appreciate his fair-mindedness, integrity of character and honest interest in their behalf, but also by the entire veterinary profession of that commonwealth. We believe, however, that New York State should not feel too keenly the loss of Commissioner Pearson, in consideration of the fact that by their loss the country in general will benefit by the work the Commissioner has relinquished his office in the Empire State to take up; *i. e.*, the study of agricultural conditions in Europe; but should feel no small degree of pride in having *had* as its Commissioner of Agriculture a man big enough and ambitious enough to have laid aside so enviable and important a position for the further pursuit of knowledge to be used for the general betterment of agricultural conditions in our country and the betterment of mankind in general.

## ORIGINAL ARTICLES.

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### OBSERVATIONS CONCERNING THE PATHOLOGY OF ROUP AND CHICKEN-POX.

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On the Pacific Coast and doubtless in many other localities the disease known as roup or avian diphtheria constitutes the chief obstacle to the poultry industry. In California and in some of the Southern States a disease called chicken-pox or epithelioma contagiosum is prevalent, and is often associated with roup. These diseases, affecting chickens, pigeons and turkeys, occur together throughout the world, although epithelioma contagiosum appears to be largely confined to warm temperature and tropical regions.

Among investigators of poultry diseases there has long been a difference of opinion as to whether nasal roup, avian diphtheria and epithelioma contagiosum were one and the same disease, or whether they were etiologically distinct. Ward has called attention to the occurrence of roup associated with chicken-pox, and has described the symptoms as follows: "The disease is characterized by a more or less viscid, ill-smelling, purulent catarrhal exudate involving the mucosa of the conjunctivæ, nares and the suborbital sinuses communicating with the latter. The exudate, on account of its viscid nature, and on account of the tortuous passages for its exit from the head, is not readily discharged through the nostrils or cleft palate. In the sinuses, which have no provision for natural drainage, the exudate collects and causes a bulging of the face in front of and below the eyes. When confined, as

in the sinuses or conjunctivæ, the viscid exudate undergoes a rapid transformation into a cheesy mass. This stage of the disease is referred to by poultrymen as 'swell-head.' Earlier stages of the disease, in which the exudate is merely noticed in the nostrils, are distinguished by poultrymen with such names as 'simple catarrh,' 'contagious catarrh,' 'ordinary cold,' etc. Exudates varying from diphtheric to croupous, according to the stage of development, appear with considerable frequency upon the mucosa of the mouth, pharynx and larynx. Wart-like epithelial tumors of the skin, especially of the head, are very frequently observed in roup fowls. The clinical evidence suggests strongly that these tumors (chicken-pox) are related etiologically to the roup."

The statements of Friedberger and Frohner, as representing the opinions of a number of European workers, are interesting in this connection. They make a distinction between croupous diphtheritic inflammation of the mucosa caused by bacteria and one caused by protozoa (class, "Gregarina"). The last type is distinguished by the occurrence of contagious epithelial tumors of the skin. Kinsley, in describing the occurrence of epithelioma contagiosum in the neighborhood of Kansas City, has mentioned the difficulty of differentiating between this disease and roup. Schmid concluded from inoculation experiments that typical pox lesions occurred in fowls having diphtheria, and that the two diseases had the same etiology. He recognized three forms—that affecting the mucous membranes, that affecting the skin, and a combination of the two. Carnwarth and other investigators have obtained similar results. Löwenthal, Burnet, Reischeuër and Stickler are also on record as favoring the belief that roup (Schleimhauterkrankungen) and chicken-pox (Geflügelpocke) are identical. The observations of Bordet and Fally tend to disprove those of Schmid. Fally observed that a recovery from roup does not protect the fowl from chicken-pox, and *vice versa*. He believes that the two diseases are distinct, but admits that a fowl may have both diseases at the same time.

Ward has described the symptoms of chicken-pox as follows:

"With us it is characterized by superficial wart-like tumors occurring upon the naked parts of the head. These are usually covered with a scale of exudate. Upon removal of the scab the tumor exhibits a whitish shiny mass that cleaves readily into minute cylindrical masses arranged perpendicular to the skin. The tumors spread rapidly from the primary focus.

"When the eyelids become seriously involved they necessarily become closed, which results in death from starvation. Ordinarily the tumors are present two or three weeks, and disappear without having caused injury. Chicken-pox is readily transmissible by inoculation. A hypodermic needle, after being passed through a tumor, is used to prick the skin. Almost without exception a distinct tumor becomes recognizable in five days."

In cases produced by artificial inoculation the disease first manifests itself by a whitening and roughening of the skin at the points of inoculation. The period of incubation may vary greatly, according to the virulence of the virus. In young chickens infection of the skin over the breast is common. This evidently occurred by direct inoculation from contact with the infected ground of the chicken yard.

Many organisms have been described by European investigators, each claiming that he has found the specific cause of roup. Moore found a number of the bacterium *septicæmia hemorrhagica* group associated constantly with roup lesions. Harrison and Streit isolated two species of bacteria, with each of which they were able to produce roup. Mack has endeavored to explain the disease on anatomical grounds as a non-specific mixed infection. Hadley believes that coccidia are sometimes the cause of infectious roup.

The controversy regarding the etiology of epithelioma contagiosum is even more complicated and confused than that regarding roup. The intracellular inclusions which are so pronounced and striking in sections of the epithelial tumors of chicken-pox have been thought by Sanfelice and Friedberger and Frohner and others to be "gregarina." Reischauer has described a partial life cycle of changes which occur in these cell inclusions.

Mark and Stickler have proven by filtration experiments that the virus will pass through a Berkefeld filter, and have inferred that the organism is, therefore, ultra-microscopic. However, it has been pointed out that the spore stages of certain protozoa may be so minute that they are thus filterable. Borrel has described a small coccoid body which has been uniformly found in smears stained with Giemsa stain. Some investigators are of the opinion that this structure is a protozoan organism, and is the specific cause of the disease. Prowazek has established a new group of protozoa, which he designates as chlamydozoa, to receive this organism and similar ones occurring in vaccinia, molluscum contagiosum, trachoma, etc. Lipschütz has suggested that this organism be named *Strongyloplasma avium* (Borrel).

*Investigations Concerning Roup and Chicken-pox at the University of California.*—Observations concerning these diseases were begun at this university by Ward in 1901. Papers reporting the results of his work are published in the 1904 and 1905 proceedings of the American Veterinary Medical Association. It has been observed by Moore and others that roup is not always readily transmitted by inoculation or association. Ward, in inoculation experiments with material from fifteen chickens affected with nasal roup, representing ten flocks, has demonstrated that the disease is readily transmitted by inoculation, and that the virus of chicken-pox is sometimes associated with roup. A study of his description of the experiment, as reported in the proceedings of this association for 1905, shows that the disease failed to be transmitted in a majority of instances. Only four of seventeen cockerels inoculated on the skin developed nasal exudates resembling roup, and one developed epithelioma contagiosum.

The following summary of our infection experiments with roup indicate that the disease may be transmitted by inoculation, but that association is likewise a certain means of transference:

*Experiment No. 1.—Transmission of Roup by Association:* Two dozen healthy chickens were taken from a yard where there had been no outbreak of roup. They were divided into two equal groups, each dozen being kept in separate and isolated places.

With one group were placed eight slightly diseased cockerels, the type of the disease in each bird being the nasal form of roup. The predominating symptoms were a liquid or semi-solid exudate from the nostrils, usually not very evident unless forced out by pressure. The conjunctivæ was also affected in six of the fowls. No diphtheritic patches were observed in their mouths. As a result of association of the twelve healthy with the eight diseased fowls all of the healthy fowls, with one exception, contracted roup. The period of incubation varied from five to twenty-two days. The virulence of the virus is shown by the fact that in four of the fowls death occurred in forty-eight hours after the first symptoms appeared. The nasal and conjunctival form predominated. No diphtheritic patches were found in the mouth, throat or trachea.

*Experiment No. 2—Transmission of Roup by Inoculation:*

A virus was obtained by taking and mixing in a beaker an exudate from the nostrils of the eight diseased fowls used for introducing infection in experiment No. 1. Six healthy fowls were vigorously inoculated with this virus by thoroughly scarifying the comb, wattles, palate, and by injecting the virus mixed with water into the suborbital sinus, and into the nostrils. Each fowl was kept in a separate coop; symptoms of nasal roup developed in two of the birds; the period of incubation in one case being ten days and in the other eighteen days. One of these birds developed a diphtheritic patch on the throat at the point of inoculation. Three control fowls, which had been injected with sterile water, remained healthy.

*Experiment No. 3—Inoculation Roup Transmitted by Association:* In order to prove that the diseased condition in experiment No. 2 was due to a roup virus and not due to a mechanical laceration, or to a non-specific infection, the two fowls which developed roup in experiment No. 2 were placed in confinement with two healthy fowls. These two previously healthy fowls developed nasal roup in twelve and fourteen days, respectively.

*Experiment No. 4—Inoculation with the Virus of Chicken-pox:* (Stock virus No. 1.) The original source of this virus

was chicken-pox scabs collected from fowls in Berkeley, May, 1906. A quantity of virus was obtained by inoculating the combs and wattles of young cockerels. The period of incubation averaged ten days. No diphtheritic or nasal symptoms occurred. A microscopic examination of one of the tumors resulting from inoculation showed the characteristic epithelial formation of chicken-pox. With this stock virus about thirty fowls have been inoculated by scarification of the comb, wattles and palate, and by an injection of sterile water and ground-up scabs into the sub-orbital sinus and nostrils. The times of inoculation were on various dates between May, 1906, and September, 1911. The stock of virus (scabs) was kept in a test tube plugged with cotton, the tube being left in a desk drawer from 1906 till 1910, and in an open box in the corner of the laboratory during 1910 and 1911. No cases of nasal involvement have resulted from the use of virus No. 1, although the occurrence of a diphtheritic membrane in the throat was common. The structures typical of epithelioma contagiosum have been demonstrated in these diphtheritic patches in two instances.

(Virus No. 2). The source of this virus was from chicken-pox scabs received from Hawaii in May, 1906. Five fowls were inoculated with this virus, with results similar to those obtained with virus No. 1.

(Virus No. 3.) Received in April, 1908, from Montana. Inoculations with this virus have been made on six fowls, with results similar to No. 1.

(Virus No. 4.) Obtained from Hawaii in July, 1911. Eight fowls were inoculated and developed typical chicken-pox, the average period of incubation being ten days. They also developed typical nasal roup, the symptoms appearing in the first fowl in fourteen days after inoculation. This roup spread to other fowls kept in adjacent coops. We believe that virus No. 4 is a mixture of roup and chicken-pox.

*Other Experiments.*—In two trials with pigeons we have failed to produce epithelioma contagiosum by inoculation with virus from fowls. This is in accordance with the findings of

Borrel, who was able to transfer the disease from pigeons to fowls, but could not again transmit it back to pigeons.

We have been able to produce a diseased condition simulating roup, or avian diphtheria, by the injection of micrococcus pyogenes aureus, and also by mechanical injury.

*The Resistance of Chicken-pox Virus to Germicides.*—Attention has been called above to the fact that chicken-pox virus will live a long time under conditions of exposure to light and dryness. Following is a summary of the tests to determine the resistance of the virus to germicides. Lack of space renders it impracticable to give the test in detail. The virus, or material with which the tests were conducted, consisted of dry pox scabs which had been reduced to a fine powder by grinding in an earthen mortar. After saturating the virus with the germicide and allowing a certain amount of time to elapse, as indicated in the following table, the virus was inoculated in the fowls by scarifying the comb with a sharp instrument which had been dipped in the virus:

5 per cent. aqueous solution of carbolic failed to kill the virus in 20 minutes.

2 per cent. liquid cresolis compositus failed to kill in 20 minutes.

2 per cent. potassium permanganate failed to kill in 20 minutes.

2 per cent. copper sulphate failed to kill in 20 minutes.

Tincture of iodine, full strength, failed to kill in 10 minutes.

Bichloride of mercury, 1-1000, failed to kill in 20 minutes.

Steam heat at 100 degrees C. failed to kill the virus in 5 minutes.

Steam heat at 100 degrees C. killed the virus in 30 minutes.

Dry heat at 200 degrees C. killed the virus in 30 minutes.

Powdered pox scabs saturated with physiological salt solution and allowed to decompose for 10 days in a warm place proved non-virulent.

Dry powdered pox scabs kept in a test tube from May, 1906, to September, 1911, proved virulent.

*Immunity to Chicken-pox.*—By numerous inoculations with virus No. 1 we have proven that an attack of chicken-pox confers immunity, which is partial on the seventh day, and becomes

complete on the twelfth day after inoculation. This immunity persists for at least three months. We have no data for determining how much longer fowls remain immune. Four fowls affected with roup have been found susceptible to chicken-pox, and two fowls immune to chicken-pox have been infected with roup by association. This is in accordance with the results of Fally, above mentioned. Fowls may be inoculated on the tip of the comb with chicken-pox, and the lesion cut off on the tenth day, after which the fowl will be immune.

*Observations Concerning the Pathological Histology and Etiology of Chicken-pox.*—About five hundred sections were prepared from the lesions appearing on the comb, wattles and mucous membranes of the mouth and throat of fowls inoculated with virus No. 1. The virus was selected because, as we have previously pointed out, there is reason to believe that it was not contaminated with roup. The specimens for sectioning were taken at varying intervals after inoculation, mostly from the third to the twelfth day, were fixed in Zenker's fluid, imbedded in paraffine in the usual way, sectioned as thin as possible and stained by the following methods: (1) Hematoxylin and eosin, (2) eosin and polychrome methylene blue, (3) iron hematoxylin, (4) Mallory's connective tissue stain, (5) Giemsa, (6) Heidenhain with Bordeaux red, (7) Mühlen's and Hartmann's stain, (8) Von Wasielewski's stain, (9) Mann's eosin-methylene blue, (10) osmic acid, and (11) Scharlach R.

A set of three hundred slides, prepared by the last six methods, was made by the preparateur in the Pathologisches Institut at the University of Munich from imbedded material which we furnished them. We also made and examined a large number of smears after staining with eosin and polychrome methylene blue and with Giemsa's stain.

The morphological changes in the tissue elements which have been noted by those who have worked on the disease have been clearly demonstrated in our material. The epithelial tumors are produced by a hyperplasia of the epithelium, due to an increase

both in the size and number of cells. The zone of growth is in the stratum of Malpighii, the principal region of proliferation being in the outer edges, from which the cells increase in both directions. The proliferating epithelium forms cell nests sinking into the dermis, surrounded by thick bands of connective tissue, which contain blood vessels with thickened walls. The rapidly proliferating epithelial cells of the Malpighian layer are seen thickly studded with granules. The nucleus contains deeply staining chromatin bodies, which are in an active process of proliferation. Karyokinetic figures are common in this region. Farther out in the epithelial tumor mass the cells are greatly increased in size and have relatively fewer granules. The nuclei are paler and show little evidence of cell division. In these cells are the large cell inclusions, which are very striking in appearance, and which Reischauer and others have thought either to be or to contain the protozoan organisms, the causative agent of the disease. There is usually but one of these bodies in each cell. They vary in size from 5 to 20 microns; most of them are round, although some of them are quite irregular in shape. They are at least partially fatty in substance, as they stain black with osmic acid. When eosin and methylene blue are used they stain a faint pink, resembling somewhat the Negri bodies found in the brain tissue of rabid animals, although they are usually much larger. They seem often to have no definite internal structure, being usually homogeneous in appearance, though with Giemsa and other differential stains structures similar to those figured by Reischauer can be demonstrated. Still farther out in the epithelial mass the cells are very large and show evidence of degeneration; here the cytoplasm stains poorly and has but few granules. Burnet has called this condition hydropic. In the center of the older epithelial cell masses the cells are so degenerated that they form a necrotic mass. The nucleus of the cell first degenerates. The central necrosis rapidly extends, involving the greater part of the tumor mass. The necrotic mass swarms with micrococci and other bacteria. It should be noted that we have isolated in pure culture two varieties of micrococci from chicken-pox tumors, one giving a white

growth and the other a yellowish growth on agar. Attempts to produce chicken-pox with these organisms have failed.

Mr. Clifford Sweet, B.S., a student in the University of California College of Medicine, has been devoting his summer to a study of chicken-pox under our direction with reference to life cycle and complement fixation. Sweet has been unable to extend our knowledge of a life cycle, and is inclined to believe the large cell inclusions are not conclusively differentiated from products of cell degeneration. In fixed preparations stained with Giemsa stain and with hematoxylin and eosin, and in fresh smears stained with Giemsa's stain, we have observed numerous acid staining bodies about one-quarter of a micron in size, which appear to be the body described by Borrel, and which Lipschütz has named *Strongyloplasma avium*. Since Mark and Stickler have demonstrated that the disease is due to a filterable virus, it is possible that this virus may be represented in some by these bodies. The virus, or whatever be the cause of the disease, evidently is present in the blood of the fowl at some stage of the disease, as Sweet has produced typical localized lesions of chicken-pox by intravenous injections of the virus and by intravenous injection of the blood taken from diseased fowls.

*Complement Fixation Reaction.*—Antigen was prepared from the liver of infected fowls and from the "tumors" removed from the heads of infected fowls by the method of Michaels and Lesser. The liver extract proved most satisfactory, and will be used hereafter. Blood was taken from the brachial artery of normal fowls and from fowls at varying periods after inoculation with *epithelioma contagiosum*. The antigen and serum to be tested were added to the hemolytic system, now so widely used for diagnosis of syphilis and glanders. Quantity for quantity the serum from the diseased fowls showed a fixation of complement not shown at any time by the normal serum. As yet we have not been able to make this as striking as the reaction which we have seen in similar tests on the blood of glandered horses, but it is sufficiently clear, we believe, to be of considerable value.

At present we are not fully prepared to say what the signifi-

cance of this complement fixation is, but it is evident that a specific anti-body is developed during the course of the disease.

### CONCLUSIONS.

1. There is good evidence to believe that nasal roup (Schleimhauterkrankungen) and chicken-pox, or epithelioma contagiosum (Geflügelpocke) are two distinct diseases.

2. Immunity to chicken-pox does not confer immunity to roup, nor *vice versa*.

3. Diphtheritic lesions in the mouth and throat of fowls may be produced by either roup, chicken-pox or mechanical injury, followed by mixed infection of various organisms. In diphtheritic lesions due to chicken-pox a microscopic examination shows the presence of the characteristic cell inclusions of epithelioma contagiosum. Epidemics have been observed in which the fowls were affected with both chicken-pox and roup at the same time.

4. Lesions similar to roup and diphtheria produced by mechanical injury or by infection with pyogenic bacteria cannot be transmitted by association.

5. Blood of diseased fowls, when injected intravenously, produces chicken-pox.

6. The blood of fowls affected with chicken-pox has the property of complement fixation to a greater extent than the blood of normal fowls.

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DR. STANTON YOUNGBERG, Lake Park, Minn., has returned to Manila, P. I.

DR. ADOLPH EICHHORN, of the Pathological Division of the Bureau of Animal Industry, Washington, D. C., will present a paper on "The Complement Fixation Method of Diagnosing Glanders" at the March meeting of the Veterinary Medical Association of New York City, and Prof. K. F. Meyer, Director of the Pennsylvania Livestock Sanitary Laboratory, will come from Philadelphia to discuss Dr. Eichhorn's paper. It is hoped the meeting room will accommodate all the veterinarians who will want to hear those two gifted gentlemen!

HORSE EXCELS AUTO.—It may be solacing to lovers of horses to know that the Frank Parmelee Transfer Company of Chicago, which has the contract for transporting passengers across that city from one railway station to another, has found after long investigation that automobiles are too expensive to run on short hauls. Mr. Charles A. McCulloch, general manager of the company, informed a representative of *The Rider and Driver* at the time of the recent stock-yards horse show that automobile agents had been trying every means to prove to him that machines were more economical than horses, but, he said, they had "not made good." He was anxious, of course, to supplant the horse if something better could be supplied, as he is "not in business for his health," but except on long hauls the horse has proven to be the best motive power. \* \* \* We are now using 700 horses and intend to increase the number. —(*The Rider and Driver.*)

## HANDLING A WHOLESOME MILK.\*

BY C. J. MARSHALL, STATE VETERINARIAN OF PENNSYLVANIA.

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In presenting the subject of "Handling a Wholesome Milk" there are many factors to be considered. During the past few years much attention has been given to this subject by dairymen, dealers, sanitarians and the public at large. There is perhaps no other branch of agriculture that has received more careful consideration from a business or sanitary viewpoint. The capital invested in Pennsylvania in dairy farming alone runs into millions of dollars. Our commonwealth is one of the chief dairy States of the Union.

Much may be reasonably expected in the future in the line of developing better business methods and perfecting the intricate and perplexing questions that exist at present. That faults do exist none can deny, and for all parties concerned it is desirable that many of them should be cleared away as rapidly as possible. The bulk of this work will be done by dairymen and dealers themselves, not by force or compulsion from legislation or regulations of boards of health, but because they can be removed by better business methods—and public opinion demands that such faults be corrected.

The State Livestock Sanitary Board was organized for the purpose of protecting and perfecting the livestock interests of the State. Let us review what it has done and is doing, and see if more and better assistance can be expected in the future in protecting the health of animals, improving their sanitary surroundings, and thus make the business more profitable and attractive,

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\* Presented at the Annual Meeting of the State Breeders' Association and the State Dairy Union, Pittsburgh, January, 1912.

and at the same time furnish to the public a more bountiful supply of more wholesome meat and milk.

The Pennsylvania State Livestock Sanitary Board was organized under the act of May 21, 1895. There was some opposition at that time from a few good farmers, on the ground that too much authority was given to the board. It appeared to a few practical farmers that it would usurp their rights and privileges and that they would no longer be masters of their own properties, but would be compelled to take orders from this board in reference to managing or conducting their own private affairs. The board immediately began tuberculin testing of cattle for tuberculosis, and still more objections and criticisms were raised. The test was considered unreliable and dangerous. They feared that animals would react, whether tuberculosis was present or not, and that if the disease did not already exist this test would cause it. Pennsylvania was one of the first States in the Union to use the tuberculin test.

As the work progressed the opposition gradually faded away, and at the present time one seldom hears, in this State, serious objections to what the board is doing. It has always been the policy of the board to force no one to make a tuberculin test. In nearly every case the test has been made, only upon the request of the owner and before it was applied, he has been warned of what might happen. The owner in all cases has been required to fill out an application form stating whether the test was to be made at his expense or at the expense of the commonwealth. In this agreement he has obligated himself to do certain things, the principal one being that he will exercise all possible precautions in the future to prevent reinfection in his herd. He has also agreed to disinfect the premises if reactions are obtained. Much better attention should be given in the future to disinfecting the stables after the tuberculous cattle have been removed. In many cases better stables have been constructed, more and better systems of ventilation, lighting, drainage, etc., have been installed, and many herds have been freed from tuberculosis.

At the present time the principal objection to tuberculin test-

ing on our own native cattle is due to the fact that the State does not pay enough indemnity for those condemned. It has always been the policy of the Board to keep appraisements as low as possible. The actual condition of the animal at the time of appraisal must be taken into consideration. We must not appraise condemned animals at more than two-thirds of their actual value and the appraisal must not exceed forty dollars (\$40) for non-registered and seventy dollars (\$70) for a registered bovine. The owner is allowed the carcass, hide and offal. In former times the carcass was condemned in the case of all reacting cattle. Now reacting cattle are appraised and slaughtered under inspection. It is estimated that about seventy-five per cent. (75%) of the carcasses of all reacting animals are now passed for food.

The prejudice that was first met in reference to passing such meat for food is gradually dying out. The public is getting a better meat supply from such cattle than was the case before tuberculin testing was introduced. Under the present regulations the carcass is now consumed for food when the inspection shows that the disease was yet in an incipient stage, while formerly the meat was used, in many cases, after the disease had become chronic or further advanced. In cases where the carcass of a condemned cow is passed for food the owner is entitled to all he can get for the meat, hide and offal, providing that this sum, added to what the State will pay him, does not exceed ninety per cent. (90%) of the actual value of the animal. Where the carcass is condemned for meat the State pays the owner the entire appraised value, and he is entitled to what he can get for the hide and offal.

Under such arrangements the State is requested to do all the testing that it can handle with the present number of competent agents and be enabled to pay for the reacting animals with what appropriations have been made for such work. At the present time there are over one hundred (100) applications filed in the Harrisburg office for tuberculin tests to be made at the expense of the State. They are being assigned as rapidly as possible. Testing at the expense of the owner is done promptly. If more generous appraisements were made on condemned animals there

would be a decided increase in the amount of work required in this line.

It has been estimated that it would cost from four to five million of dollars to make one test of all the dairy cattle in the State and pay for the reactors at the present rate. For this reason it has appeared best to those who have had this work in charge that it should go on slowly and conservatively, in the hope that more economical and effective measures may be developed. In order to judge of the progress that has been made since the Board was organized the following figures will show the number of herds and cattle that have been tested each year, the number condemned and the number of herds that have been tested and found free from the disease. In reference to this last clause, it should be remembered that in most cases the test has been made only in herds in which the disease was believed to exist. The table on opposite page.

The table covers the subject of tuberculin testing in Pennsylvania herds during the past sixteen years. The last census report shows that we have 933,055 dairy cows and 191,001 dairy herds in the State. The board has tested on an average of less than one per cent. (1%) of the dairy cows in the State each year. During the sixteen years we have tested 8,902 herds, containing 120,309 head of cattle, and have found 18,359 reactors. In most cases the reactors have been killed under inspection. Four thousand one hundred and seventeen herds were found to be free from the disease. The average percentage of reactors during the sixteen years was 15.2%. The average percentage of tuberculosis in free herds is 46.2%. During the year 1911 the results have been most encouraging. Eight thousand and fifty-nine animals were tested in 622 herds; 911 reactors, or 11.3% of the number tested, were found. No reactions were discovered in 357 herds, showing that of the number of herds tested 57.4% were free from tuberculosis. This is the best percentage record obtained during the sixteen years since the board was organized.

The United States Census Report shows the average number of cows per dairy in Pennsylvania to be 5. The average

## RECORD OF TUBERCULIN TESTS ON NATIVE CATTLE.

Year.	Number of Herds Tested.	Number of Cattle Tested.	Number of Cattle Reacted.	Number of Herds With No Reactions.	Percentage of Animals Reacted.	Percent- age of Herds With Reactions.	Percentage of Herds With No Reactions.
1896.....	432	5,430	1,191	187	21.9	56.7	43.2
1897.....	626	7,613	1,099	298	14.4	52.2	47.6
1898.....	582	6,516	1,162	220	17.8	62.1	37.8
1899.....	429	6,443	1,107	158	17.1	63.1	36.8
1900.....	651	8,475	1,314	254	15.5	60.9	39.1
1901.....	545	7,662	1,203	235	13.8	57.	43.
1902.....	375	6,066	1,024	142	16.8	62.1	37.8
1903.....	337	5,573	1,060	132	19.02	60.8	39.1
1904.....	322	5,159	891	114	17.4	64.5	35.4
1905.....	529	7,774	1,179	290	15.1	45.1	54.8
1906.....	733	7,073	801	262	13.8	64.2	35.7
1907.....	402	7,153	950	177	13.2	55.9	44.1
1908.....	501	7,083	1,037	264	14.6	47.3	52.6
1909.....	731	9,942	1,440	410	14.4	43.9	54.8
1910.....	1,085	13,288	1,810	617	13.6	43.1	56.8
1911.....	622	8,059	911	357	11.3	42.6	57.4
Totals.....	8,902	120,309	18,356	4,117	*15.2	*53.7	*46.2

\*Average percentage.

number in herds tested during the past sixteen years is 13. The percentage of cases of tuberculosis is known to run higher in large herds than in small herds. It is believed that careful, conscientious work is being done in testing cattle for herd owners in Pennsylvania. The owner, in most cases, desires to know positively to what extent the disease exists in his herd, and he willingly disposes of the ones condemned. Such work is generally done by the best veterinarians in the State.

The results are not so good on tests applied to cattle shipped in from other States. The law makes it compulsory to have all cattle brought into the State for dairy or breeding purposes physically examined and tuberculin tested. It is believed that tuberculosis is just as prevalent in other States where dairy cows are raised as it is in Pennsylvania. The tuberculin test has been applied to a much larger number of interstate cattle in Pennsylvania during the past year than on our own dairy cattle and the proportion of reacting cattle reported is only about one-tenth as great. The owner must pay for this test on interstate cattle, and it is a violation of the federal law to return or ship a reacting bovine animal from one State to another. Such condemned animals may be slaughtered under inspection, and if the meat is found fit it can be sold for food.

In case of interstate cattle the purchaser usually exercises all precautions that can be expected of a layman to avoid purchasing tuberculous animals. If he is a dealer, it is for his interest to get as many of his animals safely by the inspector as possible. In too many cases he dodges the law or gets the cheapest, and consequently the most unreliable, veterinarian possible to make the test. The veterinarian that stands firmly for principle and will do only reliable, honest work is not popular with dishonest dealers. Dairy-men should insist on tuberculin tests being applied by competent, reliable veterinarians when purchasing interstate cattle.

It must be admitted that good dealers can select tuberculosis free animals much better than the average breeder or dairyman can, yet it is doubtful if anyone, even a trained, competent veterinarian, can diagnose tuberculosis by a physical examination in

more than 25% of even animals that have reacted. A veterinarian does well if he can pick out by a physical examination the cases that are sufficiently far advanced to be condemned by a meat inspector after slaughter, and this represents only about 25% of the animals condemned by a tuberculin test.

Tuberculin testing and handling reacting cattle is not the only work done by the board in controlling tuberculosis in the State. Under the *Butchers' Indemnity Act*, the board is authorized to appraise and destroy the carcasses of animals having generalized tuberculosis, to prevent the meat from being sold for food. It is a misdemeanor for anyone in the State to sell or offer for sale meat from a case of generalized tuberculosis.

A good many dairy cows are condemned on physical examination, and they are appraised and destroyed under inspection. When a veterinarian reports a case of suspected generalized tuberculosis in a bovine animal, one of the meat hygiene agents is sent to see the animal. If he confirms the diagnosis, he is authorized to appraise and destroy it. The owner in such cases is advised, but is not compelled to have the balance of his herd tested with tuberculin.

During the last year the board was asked to take charge of milk hygiene work. This is done under Section 6 of the Act of Assembly (P. L. 91), approved May 21, 1895, and under Section 6 of the Act of March 30, 1905 (P. L. 78), which gives the board power to co-operate with local boards of health for the protection of the milk supply. It is the purpose of the board to adopt the same conservative and sane methods in the milk hygiene work as has characterized it in reference to handling the subject of tuberculin testing, meat hygiene, etc.

Considerable work has already been done in various parts of the State, and so far very little opposition has been encountered. The inspections are being made by local veterinarians. In the principal dairy sections the veterinarians in the counties have organized, each county having its own organization, and each member has been assigned a certain territory. In some cases the divisions are made by townships. The veterinarian agrees to inspect

the dairies in his district and report his findings to the board, and he receives seventy-five (75) cents for each report sent in. The board furnishes him with a blank form of report, similar to the one recommended last year by the commission appointed by the Mayor of Philadelphia to study the milk question in that city and report means for improving it.

The agent's report is rather lengthy and it takes considerable time to fill it out properly. The purpose of the present plan is educational. It is believed that it should be used until each inspector is familiar with the fifty-seven recommendations. The local associations are holding monthly meetings and discussing the various phases of the work, and whenever possible the board furnishes an experienced agent to attend these meetings and discuss milk hygiene work with them. Good progress is being made in placing the work on a uniform basis, and it may be best in the future to adopt a percentage score card similar to the one recommended by the federal government.

A perfect score indicates an *excellent* dairy, such as a first-class certified dairy. There are very few *excellent* dairies in the State at present, the principal reason why there are not more being due to the fact that such conditions cannot be provided at the popular prices at which milk must be sold. The next grade is *good*, and there is a large number of such dairies. In order that a dairy be graded *good* it must be known that an intelligent effort is being made to keep the herd free from tuberculosis and all other diseases, and that the man at the head of the dairy is intelligent and understands the dairy business. His cows are kept reasonably clean and a plentiful supply of wholesome care, food and water is provided. He must have a suitable place to store the milk on the farm and ample facilities for washing and cleansing the dairy utensils.

The next grade of dairies comprises the class known as *fair*. The manager of a dairy in this class may or may not be a believer in the tuberculin test; he conducts the dairy business as very much of a side issue to general farming or other business; his methods and facilities for storing milk on the farm, washing dairy utensils,

feeding, watering, bedding and grooming cows are not good, yet from his intelligence and appearance and the effort expended in his work it is not considered that he would permit the milk from known diseased cows to be used, nor would he allow, in any way, milk to be contaminated to a nauseating or dangerous extent.

The board has received reports on over ten thousand (10,000) dairies since the work was begun, and practically 10% of them are scored *bad*. Some agents mark closer than others, but the instructions are to mark dairies *bad* only where conditions are filthy or in such a condition that the public health is endangered in consuming the product. The principal defects that characterize such dairies as *bad* are the ignorance and carelessness shown on the part of the dairyman and his helpers. All dairymen have difficulty in obtaining efficient help. In bad dairies the work is principally done by the most illiterate, unreliable and inefficient class of laborers.

An agent is instructed to visit all dairies, both large and small, in his territory at least once each year where milk is sold for any purpose. One inspection each year is considered enough for those that are scored as *excellent* or *good*. More frequent inspections are to be made where conditions are *fair*, and we hope to visit dairies reported *bad* once each month.

In addition to the local agents, the board employs two or three competent, reliable men, who are paid by the month. They are known as traveling agents. These agents endeavor to visit, with the local agents, the *bad* dairies in each district. The purpose of the visit of the traveling agent is to see that an injustice has not been done the dairymen by scoring his place *bad*, and, if possible, persuade him to rectify the objectionable features. A few such dairymen are cleaning up and installing safer and better methods. Some have made improvements sufficient to place them in the *good* class.

There is a certain element among the dairymen of the State who are obstinate, too ignorant or too slovenly to be expected or trusted to do better or safer work, and it is with this class that trouble is anticipated. For the present it is proposed to use all

reasonable persuasion to clean up or clean out *bad* dairies. Intelligent dairymen, dealers and consumers can assist in this work. After the local agent has exhausted his resources in an effort to remove objectionable features, the traveling agent is requested to do what he can in a peaceable way.

If the traveling agent is satisfied that the dairy is *bad* and that the prospects for improvements are bad, the dealers, proprietors of butter or cheese factories, local boards of health and the consumers may be notified and requested to co-operate, and if the classification as *bad* is verified, assistance will be expected in disposing of the case in a just and satisfactory manner. Dealers and consumers should exercise all reasonable precautions to procure milk only from dairies that are managed by intelligent, trustworthy dairymen, who are equipped with healthy cattle, sanitary stables, wholesome food, healthy, efficient help and ample facilities for washing and cleansing dairy utensils, safely cooling and storing the milk while on the farm in a cool, sanitary place.

Radical changes or improvements should not be expected suddenly. It is hoped that those who are interested in placing the dairy business in the high and honored position that its worth justly merits will co-operate in bringing about necessary changes and thus eliminate, as much as possible, the objectionable features from the few who are the cause, at present, of so much unjust criticism on the many who are doing good work.

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W. L. HERBERT, V.M.D., York, Pa., has been elected to the City Council, and made chairman of the Sanitary Committee of said city.

DR. DAVID W. COCHRAN's report of the conference at Ithaca formed an interesting part of the programme at the February meeting of the Veterinary Medical Association of New York City. Dr. Williams' lecture on sterility in cows, illustrated by lantern slides, was an interesting and instructive feature. Dr. Fish's address on "Bob Veal" also aroused considerable interest, and Dr. Adams, of Philadelphia, captivated his audience by the clearness with which he described methods of diagnosing lameness.

## ARSENICAL POISONING FROM SMELTER SMOKE IN THE DEER LODGE VALLEY, MONTANA.

BY D. E. SALMON, D.V.M., MONTEVIDEO, URUGUAY.

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V.—(*Continued from February Issue.*)

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*The Question of Increased Tolerance of Arsenic.*—We are naturally led to ask, from the preceding observations, if animals do not become accustomed to arsenic, by ingesting it constantly, so that, like the arsenic eaters of Austria, they can absorb without injury a dose that would be dangerous or fatal to similar animals that had not previously been subjected to the influence of the poison. This is a very interesting and pertinent question, and it is well worth studying. Unfortunately, our knowledge of the arsenic eaters is not altogether definite and reliable. Tschudi, in 1851, reported that the mountaineers of certain districts of Austria took arsenic to increase their vigor and strength, to aid their respiration, and to make them feel lighter when ascending the mountains. Some thought it increased their genital powers. The women took it to improve their complexions. At the beginning of the arsenical treatment, they did not take more than about 2 centigrams (0.309 grain) of arsenious acid per week, but increased the dose progressively until they reached 20 centigrams to a gram (3.09 to 15.45 grains) per week. It was reported that one man took 15 to 20 centigrams (2.32 to 3.09 grains) daily. Knapp says that two of these arsenic eaters were presented to the Medical Congress of Gratz, in 1875, and swallowed before the members of the congress, one of them 40

centigrams (6.18) grains) of arsenious acid, the other 30 centigrams (4.63 grains) of orpiment.

P. Brouardel, (14) commenting on this, says these facts are surprising, and it would be interesting to be certain of the quality of the arsenic employed and the proportion of arsenious acid contained in the orpiment. He further says that this habit is not without danger, and refers to two deaths reported from acute arsenical poisoning, and to the statement of Marik and others that many of these arsenic eaters die victims of arsenical intoxication. Moreover, it appears from the report of a government commission that the dose ingested is generally less than 0.62 grain.

G. Brouardel (15) made a number of experiments with guinea pigs and rabbits, giving the arsenic by the stomach and by hypodermic injection. With some of the animals the doses were increased with irregular intervals; with others, moderate doses were given for a long time with regular intervals; with still others, the doses were increased irregularly. Among all of these animals, there were two guinea pigs only which were able to support a dose slightly larger than the fatal dose for animals of the same species and weight which had not before taken the poison. These two had received the arsenic by way of the stomach. The fatal dose for normal guinea pigs, administered in this way, was 2 to 3 milligrams per 100 grams of body weight, and these two were able to support 3.5 milligrams per 100 grams. None of the others presented the least degree of accustomance, but, on the contrary, succumbed to doses which were below the minimum doses for untreated animals of the same species. This increased susceptibility he attributes to the storing up of arsenic in the body.

Experiments made by the writer with dogs confirm the results obtained by G. Brouardel with rabbits and guinea pigs. One of these experiments is so interesting that the details are given in a slightly condensed form, as follows:

*Record of Arsenical Treatment, Dog No. 1.*—Male dog, young and in good condition of flesh; weight 29 kilos; affected

with chorea of right foreleg. Injected subcutaneously with arsenic in neutral solution as shown below:

1910, September 12, 2 mg.; 13, 3 mg.; 14, 4 mg.; 15, 5 mg.; 16, 6 mg.; 17, 7 mg.; 20 (weight 28 kilos), 7 mg.; 21, 8 mg.; 22, 9 mg.; 23, 10 mg.; 24, 10 mg.; 25, 11 mg.; 26, 12 mg.; 27, 14 mg.; 28, 16 mg.; 29, 18 mg. (weight 29 kilos); 30, 20 mg.; October 1, 22 mg.; 2, 24 mg.; 3, 26 mg.; 4, 28 mg.; 5, 30 mg.; 6, 33 mg.; 7, 36 mg.; 8, 39 mg. (weight 29½ kilos); 9, 39 mg.

On date last mentioned, urine became cloudy, and this proved to be due to a considerable number of desquamated epithelial cells, diagnosed as superficial pavement epithelium. Appetite diminished. No albumin in the urine up to this time. The dose reached was equal to 1.32 mg. per kilo of body weight.

October 10, 42 mg. (urine normal); 11, 39 mg. (slight gastric disturbance and tendency to diarrhoea); 12, no injection, urine slightly turbid, turbidity due to minute oil droplets; 14, 33 mg. (weight 30 kilos); 18, 36 mg.; 19, 40 mg.; 20, 40 mg.; 21, 40 mg.; 24, 40 mg.; 26, 44 mg.; 27, 45 mg.; 29, 45 mg. (first appearance of albumin in urine, estimated at 1/6 gram per mille); 30, 45 mg.; 31, 50 mg. (weight 29 kilos).

November 1, 50 mg.; 3, 50 mg. (no albumin); 4, 55 mg.; 5, 60 mg.; 7, 65 mg.; 8, 72 mg.; 9, 78 mg.; 10, 84 mg.; 11, 90 mg.; 12, 96 mg.; 13, 78 mg. (animal not so lively as usual; œdematous swelling at lower margin of flank and under abdomen; trace of albumin in urine; local irritation from injections; 15, 84 mg. (slight salivation); 19, 72 mg.; 21, 72 mg.; 28, 72 mg.

December 6, 44 mg.; 9, 60 mg.; 12, 60 mg.; 13, 60 mg.; 14, 60 mg.; 15, 64 mg.; 19, 72 mg.; 21, 72 mg.; 22, 72 mg.; 23, 72 mg.; 24, 72 mg.; 26, 72 mg.; 27, 72 mg.; 28, 72 mg. (weight 27½ kilos).

1911, January 16, 75 mg.; 21, 75 mg.; 23, 80 mg.; 24, 80 mg.; 25, 80 mg.; 31, 80 mg.

The animal died three hours after the last-mentioned injection, with acute congestion of the abdominal organs, and especially of the liver and kidneys. The symptoms of chorea were only slightly improved during the course of the treatment.

The points which seem to be important in this experiment are:

1. The dog died after a dose of 80 milligrams, or 2.9 milligrams per kilo of body weight, there having been an interval of six days since the preceding dose.

2. A week previously he had taken three doses of 80 milligrams, on consecutive days, without serious general symptoms.

3. Nearly three months previously he had taken 84, 90, and 96 milligrams on consecutive days and survived, the last of these doses being equal to 3.3 milligrams per kilo.

It is evident, therefore, that this animal, instead of becoming more tolerant of the arsenic, really became more sensitive to it, as did the greater part of Brouardel's rabbits and guinea pigs.

It may be asked, however, if the gradual increase in the dose during the first two months did not accustom the animal to the poison and enable it to sustain a larger dose than would be possible under normal conditions. To elucidate this point, experiments made with dogs Nos. 2 and 5 will be briefly cited.

With Dog No. 2, weight 33 kilos, the injections were commenced October 14, with 36 mg., and were gradually increased, reaching 100 mg. November 13, which was the seventeenth injection. This dose caused very grave symptoms, and a repetition of the same quantity two days later (November 15) led to death on the following day. This animal would probably have recovered from the first dose of 100 mg., equivalent to 3 mg. per kilo body weight.

Dog No. 5, weight 44.75 kilos, was given as a first dose 112 mg., at a single injection. This was equivalent to 2.5 mg. per kilo. The symptoms were great dejection and dyspnoea, but no albumin appeared in the urine, and in five days the general condition was again good.

From these experiments, the writer is of the opinion that Dog No. 1 acquired little if any increase in his powers of resistance as a result of the treatment of the first two months, but being young and having active eliminating organs, he was able to take a somewhat larger dose than Nos. 2 and 5 without fatal

results. The difference was not sufficient, however, to have much significance, even if it were due to an acquired tolerance of the poison.

The fatal dose, as indicated by these experiments, is very close to that reached by Rouyer, who fixed it 2.5 mg. per kilo by intravenous injection. As it requires 30 to 40 per cent. more by subcutaneous injection to produce the same effect, Rouyer's results are equivalent to about 3.5 mg. per kilo by this method, or slightly more than the largest dose survived by Dog. No. 1 after two months of arsenical treatment. The results of Rouyer, therefore, confirm the opinion already expressed that this dog acquired no increased power of resistance by this long period of treatment with gradually increasing doses.

Launoy has also shown by experiments on guinea pigs that there is no real accustomance to arsenic so far as the tissues are concerned. According to Cloetta, if there appears to be accustomance to this poison among the inhabitants of the Tyrol, it is due to lack of absorption by the intestine, nearly all of the arsenic being rejected with the excrements. This also is the opinion of Porcher. (16)

The indications are that this change in the power of absorption, if it occurs at all, is only observed when  $\text{As}_2\text{O}_3$  is ingested in powder. This powder, as is well known, not only dissolves slowly, but is moistened by water with the greatest difficulty, as each minute particle seems to be surrounded by a gaseous atmosphere which makes the powder, though of greater specific gravity than water, float on the surface and refuse to either dissolve or form a paste. Sometimes, after boiling in carbonate of soda solution for an hour, a considerable part of the powder will be found on the surface of the solution, or running up the sides of the flask far above the level of the liquid.

It is undoubtedly this property of arsenic which makes the results of the administration of the drug in powder so irregular, and which permits of enormous doses being taken at times without any ill effects. If the poison is administered in solution, and, above all, if it is injected subcutaneously or intravenously, the

fatal dose is fairly constant, taking into consideration the species and the weight of the animal.

Flue dust and smoke dust are, however, very different substances from arsenic trioxid. The samples of flue dust examined by the writer consisted of a dark gray powder which immediately forms a paste with water, with the simultaneous disengagement of considerable gas, and the paste having a strong acid reaction. The dust collected from the hay in the Deer Lodge Valley also immediately formed a paste with water. With neither the flue dust nor the hay dust was there anything in the physical properties to form an obstacle to the solution of the arsenic contained therein, which had any resemblance to the property of white arsenic just described that keeps water from coming into direct contact with it.

The writer is of the opinion, from his observations, that there was little, if any, of the so-called tolerance to arsenic manifested by the animals of the Deer Lodge Valley. The arsenic seemed to be freely absorbed from the intestines, and there was an evident accumulation in the tissues, sometimes reaching an extraordinary quantity.

The continued sensitiveness to arsenic and its accumulation in the tissues in great quantity may at first thought seem to involve a contradiction, but it must be remembered that the most serious effects of arsenic are due to its action on the nervous system and on the eliminating organs. According to Besredka, the minimum fatal dose, when injected directly into the brain of rabbits, is one hundred times less than when injected subcutaneously, while the symptoms and lesions were the same in the two cases; that is, there were diarrhoea and gastric, hepatic and renal lesions.

According to the same observer, when the poison is injected subcutaneously or intraperitoneally, it is taken up by the leucocytes and transformed into a non-toxic compound, which is eliminated before it reaches the nerve cells, and intoxication is only produced when the quantity of poison is so great that the leucocytes are unable to absorb it all. (17)

Whether this theory is, or is not, in all respects correct, the conclusion reached from a review of the various observations herein cited is that, when arsenic is absorbed in repeated doses, it enters into organic compounds which are relatively non-toxic, and in this form may accumulate and remain for a considerable period in the liver, kidneys, muscles, bones, etc. That if the doses are long-continued, or are increased in quantity, a point is reached in the accumulation at which local irritation is produced; and as, sooner or later, the accumulation must necessarily reach its maximum and the excretion equal the intake, there will at that time be the greatest quantity of free arsenic circulating in the blood, with the greatest probability of causing intoxication of the nervous system and irritation or inflammation of the eliminating organs through which the arsenic passes, as the kidneys, the liver, the intestines, the lungs, etc. That animals in which such accumulation has taken place are, in the great majority of cases, killed by an equal dose, or even a smaller dose, than is fatal for an animal of the same species and weight which has not previously been under the influence of arsenic.

While, therefore, the Deer Lodge Valley animals certainly ingested arsenic daily for long periods of time and had considerable quantities stored up in their organs, the writer is of the opinion, from his observations made in the valley, from his experiments made while he was there and subsequently, and from the literature which he has consulted, that very few of these animals possessed any acquired tolerance towards this poison or were, from any cause, able to withstand a larger dose than they could have withstood if they had not previously ingested the poison. There were probably a much larger number with diminished resisting powers, so that, in general, the animals became more susceptible, rather than more resistant.

#### ACCUMULATION OF COPPER IN THE TISSUES.

In addition to the accumulation of arsenic, there was apparently a much greater accumulation of copper in the tissues

of the Deer Lodge Valley animals. The first accurate information the writer had of this fact came through a verbal communication of Prof. John Marshall, who analyzed a few specimens of organs from these animals and found them heavily loaded with copper.

Harkins and Swain determined the quantity of copper in three specimens, as follows (18):

*Quantity of Copper Found in Animal Tissues from Deer Lodge Valley.*

Description of Specimen.	Miles from Smelter.	Copper, Parts Per Million.
Liver of cow.....	3 S.E	88
Green fat from shoulder of colt.....	2 S.	288
Liver of sheep.....	8 N.	592

No experiments were made to determine what effect such quantities of copper in the tissues would have upon the health of the animals, but that it would have a deleterious action and diminish the power of resistance to arsenic seems probable. The arsenic being the principal toxic agent, however, and the time for investigations being limited, the chemical work was mostly directed with the object of determining the quantity of this poison in the food and in the animal tissues; but it would be interesting, nevertheless, to know more of the part, if any, played by the copper in aiding the development of the symptoms and lesions observed in the animals of the valley.

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DR. C. J. MARSHALL UNDERGOES OPERATION.—Veterinarians throughout the country will be glad to learn that Secretary Marshall, of the American Veterinary Medical Association, is doing nicely after an operation for appendicitis, which was performed January 23. Dr. Marshall was dismissed from the University Hospital, Philadelphia, February 6, and two days later left with Mrs. Marshall for Jamaica, West Indies, where they will remain until the doctor regains his usual good form.

DR. J. H. McNEIL, professor of surgery and obstetrics, Ohio State University-College of Veterinary Medicine, has accepted a position in Brazil as Chief Veterinarian for the Brazil Land, Cattle and Packing Company, with headquarters at Sao Paulo, Brazil; for which place he sails about March 1. We are sorry the good doctor cannot stay and help us fight out the army veterinary bill question with Congress, but wish him "God speed" toward his new field of activity and usefulness just the same.

A POLICE DOG of the New York City force has recently demonstrated his usefulness by saving eight people who were caught in an ice floe in the Long Island Sound and their little gasoline boat was in imminent danger of being crushed to splinters as the ice wedged tighter about it. The dog carried a line from the police patrol boat to the party in the gasoline craft and placed it in the hand of one of the men. The dog crossed on the floating ice that prevented the police boat from getting up to the party in distress. A man would have courted death had he attempted to do what the dog did with apparent ease.

## **SOME OF THE FEATURES OF SANITARY POLICE WORK AS APPLIED IN THE FEDERAL QUARANTINE SERVICE.\***

BY R. N. HICKMAN, CHIEF OF QUARANTINE DIVISION, B. A. I., WASHINGTON,  
D. C.

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*(Continued from February Issue.)*

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The cattle were shipped from Bombay April 27 for Hamburg, where they were transshipped on June 2, arriving at New York on June 16, where I made their acquaintance, being at the steamer dock to receive them and supervise their transfer to a special place of quarantine which had been prepared at a point about 16 miles down the bay, known as Simonson's Island, quite an isolated spot adjoining Staten Island, located on the Fresh Mills, an estuary of Staten Island Sound, and separated from Staten Island by ditches and wide salt marshes, subject to overflow. Beside the blood examinations at Poona, two additional microscopical examinations of their blood were made during the ocean voyage, the presence of the surra trypanosome was not detected, and the cattle all arrived in apparently sound health. Notwithstanding which, and the blood examinations, two at Poona and two en voyage, it was deemed advisable to make blood inoculations, which was done under the direction of Dr. Mohler, a report of which is published in the Twenty-Sixth Annual Report of the Bureau. It was found, as a result of the first inoculations with the blood, from the 49 adult cattle, that three animals were infected. The seriousness of the situation from the owner's standpoint will be apparent, as the zebus were tied on two sides of an open corral, 100 feet square, without means to protect any of

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

them from the various kinds of biting flies, which were present in great numbers, including the *Tabanus atratus*, the big black horse fly or breeze fly, the green head horse flies (*Tabanus lineata*, *Tabanus costalis*), and the *Stomoxys calcitrans*, the former of which, however (*Tabanus atratus*), Dr. Mohler believes to be responsible for spreading the infection to other animals. These exhibited a predilection for the hump, and two or three of these big black horse flies would be seen on a hump at the same time. Upon discovery of surra in the herd, I made another trip to New York, met Mr. Borden, and, with the superintendent of the animal quarantine station for the port of New York, and Dr. Wm. Thompson, proceeded to purchase the cotton netting, the combined stock of two department stores, took it to Simonson's Island, and having difficulty to get carpenters on short notice, went to work with such help as could be hired, in putting up an "L" shaped frame with netting cover, completely closing in the two sides of the corral. It was deemed necessary, however, in order to absolutely determine and limit the extent of the infection, to put up a frame building with box stalls, so that each animal could be screened off separately, which the importer did, with the result that after the last seven series of tests were successfully negative, and as killing frosts had occurred, the remaining animals, 33 in number, were released from their five months' quarantine on November 14, and shipped to their destination in Texas, 18 out of the original herd having been destroyed because of surra infection.

This importation of India cattle probably contained the finest specimens of the respective breeds ever brought to America. Their size and general appearance was a surprise to everyone who had only seen the small specimens such as are usually exhibited at menageries and zoological gardens. Dr. Thompson is shown, in the Annual Report, beside one of the bulls, whose hump is as high as the top of his hat. This bull measured six feet in height, that is, to the top of his hump, and weighed 1,860 pounds, while the menagerie zebu weighs about 250 to 300 pounds, and measures not higher than three feet.

As another concrete example of the efficiency of the Federal quarantine, in its sanitary police service, I desire to briefly refer to an importation made in 1905, after a broad investigation of the subject in the interest of the milch goat industry, consisting of 65 head of goats, 4 males and 61 females, from the Island of Malta. Quite a complete history of this importation, by Dr. John R. Mohler, and Dr. Geo. H. Hart, his assistant in bacteriology at that time, is published in the Twenty-Fifth Annual Report of the Bureau. The article contains a description of the Maltese goat, its adaptation for breeding and milk production, and of the investigations and results leading to and following the discovery in their milk and urine of the *Micrococcus Melitensis*, the causative agent of Malta fever. These investigators concluded that the organism of Malta fever lives a more or less passive existence in the body of the goat, exercising its pathogenic effect when it gains entrance to the human body. Blood examinations in the case of both goats and kids were made from time to time. On October 17, 1906, seventeen remaining adults were again tested, and two of the eight which, on June 1st, gave an imperfect reaction now gave a positive reaction, consequently, after due consideration, it was decided that the only safe course rested in the destruction of them all, including their progeny, which was done. Thus while the parties interested in the Maltese goat enterprise completely failed in securing the coveted breeding stock, and were far less fortunate than in the case of the Brahman cattle importation, the extinction of the goats accomplished the devoutly to be desired object, in view of the circumstances, namely, the extinction of the *Micrococcus Melitensis*, without its having gotten out of quarantine.

The usual period of quarantine for cattle imported from Great Britain, Ireland, and the Channel Islands, is thirty days, counting from the date of arrival at the quarantine station. For cattle from other countries, except North America, it would be ninety days counting from the date of shipment, or date of clearance of the vessel.

Sheep, and other ruminants, and swine, except from North

America, are subect to a quarantine of 15 days, counting from the date of the arrival at the quarantine station. All dairy and breeding cattle are required to pass a satisfactory tuberculin test. Those from Europe, by a Bureau inspector stationed in England. In the case of dairy and breeding cattle from Canada, a tuberculin test certificate by an authorized Canadian official veterinarian is satisfactory to the United States government.

Menagerie ruminants from countries in which surra exists, as well as other kinds of menagerie animals, when it is thought necessary, are subjected to blood tests by rabbit inoculations. Horses from any part of the world except Asia and Africa are permitted entry on passing a satisfactory inspection at the port of entry.

Dogs, except from North America, are subject to inspection at the port of entry. Collie, shepherd, or sheep dogs are subject to quarantine, not to exceed two weeks, or until it can be determined by proper examination whether or not they are the hosts of the *Taenia coenurus*. Horses, asses, mules, sheep, goats, and swine from Asia and Africa, on account of the trypanosomes, are prohibited by B. A. I. Order 174. Cattle are not included in this order for the reason that Section 12 of the Act of Congress of 1909 prohibits the importation of neat cattle, unless or until the operation of such prohibition shall have been suspended as to any foreign country or countries by the Secretary of the Treasury, who must officially determine and give public notice thereof. This was a re-enactment of the old law, which permitted of importations of cattle only on proclamation of the President, but transferring the authority to the Secretary of the Treasury, which is exercised upon recommendation of the Secretary of Agriculture, in accordance with which Treasury Department Circular, issued October 20, 1909, provides for the suspension of the operation of this section of the law as applying to cattle from the countries of Great Britain, Ireland, the Channel Islands, and North America, including Mexico.

The diseases which probably cause most annoyance in quar-

antine are necrobacillosis, foot rot in sheep, and infectious diarrhoea of young calves, which become manifest on shipboard or after arrival at the quarantine station. I think it can be said, however, without any qualification whatever, that the proper and satisfactory handling of the work in connection with the importation of hides and skins from a majority of the various foreign countries of the world is the most difficult problem with which the sanitary police service of the Bureau of Animal Industry has to deal. The importation of hides is subject to the same law, that is to say, Section 12 of the Tariff Act of August 5, 1909, as provides for the importation of cattle, and to regulations issued by the Secretary of the Treasury, on recommendation of the Secretary of Agriculture. The regulations now in effect are known as Treasury Department Circular No. 23, Division of Customs, dated May 2, 1910, entitled, "Disinfection of Hides." In order to state the matter concisely, I will just explain that the methods of disinfection are prescribed as follows:

1. By immersion in a 1-to-1,000 solution of bichloride of mercury.
2. By immersion in a 5 per cent. solution of carbolic acid.
3. By exposure (suspended separately in a tight room) to sulphur dioxide.

Exceptions are made in the disinfection requirements in the case of:

1. Hides, the product of, and imported from any part of North America.
2. Hard, sun-dried hides, also, old and worn-out articles of manufacture made from raw hides, such as loom pickers and mallet heads, imported as glue stock.
3. Hides and hide cuttings and parings, or glue stock, which have been lime dried after soaking for forty days in a strong lime wash made by slaking quicklime in water, and containing sufficient lime to be of a creamy consistency.
4. Abattoir hides, the product of Sweden, Norway, New Zealand, Australia, or Great Britain, when accompanied by a certificate of an official veterinarian showing that the same were

taken from cattle free from disease at the time of their slaughter.

5. Hides taken from American cattle killed in lairages in Great Britain.

While in the case of all hides offered for shipment from districts of any country in which anthrax is prevalent, disinfection by immersion for at least 30 minutes in a 1-to-1,000 solution of bichloride of mercury only is permitted, and certificates of disinfection, by the consular officer of the district from which shipped, are required, otherwise they are treated as prohibited importations and denied entry. Also as the disinfection of such on the dock of the importing vessel, upon arrival in this country, or their entry for transportation to another country across American territory, is not permitted, for the reason that the landing of diseased hides would tend to the dissemination of cattle diseases, it will be observed that when vessels arrive from foreign countries, with hides on board, which do not belong to the excepted classes, and are unaccompanied by proper consular certification, there is no alternative but for the inspector to see that such hides remain on the vessel and depart with her at the time of her scheduled sailing, which, of course, is not agreeable to either the consignor or the consignee.

Owing to the hide output of the big slaughterers and packers in the United States being now to a great extent tanned in their own establishments, the owners of exclusively tanning establishments state that they are absolutely dependent upon foreign importations to keep their tanneries in operation, and that in consequence of the common prevalence of anthrax in some portion or portions of the hide exporting countries, and the strict enforcement of our sanitary regulations, they are utterly unable at times to procure the necessary stock. A very considerable amount of attention and investigation has been directed to the matter of discovering a practicable method of anthrax sterilization as affecting hides, skins, hair, and wool, without yet having reached a satisfactory solution of this intricate problem. It is claimed by the tanners that the requirements of our sanitary regulations are equivalent to prohibition, since by the immersion of

either green-salted or sun-dried hides for 30 minutes in a 1-to-1,000 solution of bichloride of mercury, they are seriously injured for the manufacture of leather, and the experiments of the Bureau in this connection would indicate that such is the case, and particularly so as applying to the hard-dried hides, which latter the British reports show to be much more frequently than green or pickled hides and skins the source of anthrax infection among the handlers and workers.

It has been arranged during the past year, through the State Department, and its consular service, for the prompt transmission of information by the Bureau of Animal Industry to the tanning and leather associations of the United States regarding the prevalence of anthrax in a consular district, in order that the trade may in turn notify their foreign buyers and stop purchases. But to satisfactorily meet the requirements of the situation something more than this is needed. In all tropical and semi-tropical countries, such as India, China, Africa, and South America, skins are dried either in the sun or in a shaded air current, or are plastered over with an earth salt while drying. The restoration of all such hides to the green, raw, or wet state has always been a source of difficulty and loss to the tanner.

Hides, skins, as well as hair and wool, are at present, I believe, admitted into Great Britain without disinfection or sanitary supervision, especial attention being directed to the posting of hide cellars, factories, and wool sorting rooms, with printed instructions in the working and handling of these materials as related to the avoidance of anthrax infection, together with its characteristic appearances in the human subject, by means of pictures to aid in its recognition, and to the importance of promptly applying to a designated source for skilled treatment at the first appearance of symptoms.

During the latter part of last winter the Bureau received from the American consul at Bradford, England, the Fifth Annual Report of the Anthrax Investigation Board for Bradford and district, for the year ending October 31, 1910. In his letter of transmittal, the American consul stated that Dr. F. W. Eurich,

the Bacteriologist of the Anthrax Board, was experimenting with a discovery recently made by Mr. Alfred Seymour-Jones. At about the same time the Bureau received a booklet from Mr. Alfred Seymour-Jones, with the compliments of the author, in which he claimed to have solved the problem of sterilization of anthrax spores in hides, skins, hair, and wool, without injury to these articles; that on the contrary, his process was very efficacious in preserving hide substance, and that even hard, sun-dried hides could, after sterilization, be quickly restored to their former condition, while under previous methods which had been tried, dry hides and skins, in soaking back, were apt to lose a relatively large percentage of their weight, owing to the solution of the decomposed skin matter. In this process two pits are used, the first or sterilizing pit containing one per cent. of formic acid of 90 per cent. strength, and one part of mercuric chloride to every 5,000 parts of water. In this pit the hides are left 24 hours, taken out and drained, and placed in the second pit, containing a saturated solution of common salt in water, with a good layer of undissolved salt lying on the bottom of the pit. In this pit the hides need not be left more than an hour, when they are hauled up and placed on a drainer, the drainers of both pits being so arranged that the solutions run back into their respective pits for further use. The treated hides may be opened out, flesh side up, and dry salted, and then placed in a pile for a few days before baling, or they may be again dried.

The statements in the Seymour-Jones booklet are to the effect that the formic acid alone does not sterilize the anthrax spore; that the dried hide absorbs the bichloride under the influence of the formic acid present in the bath, while in the case of the bichloride solution alone neither the blood clot on the surface of the hide, nor the hide substance, are penetrated by the bichloride. Also, that the formic acid being very readily absorbed by colloidal albuminoid substances, blood, gelatine, or hides; that it, by its presence in the sterilizing dip (as shown by treating hides with a dilute formic acid solution) renders the hide capable of satisfactory salting or re-salting, as it will readily

absorb salt, if after treatment with the formic acid solution, it is subjected to soaking in saturated salt solution, or to dry salting. So as this treatment is inexpensive, it will be seen that should it be found as represented, it would appear to be almost ideal.

In view of the work that is being done by the Anthrax Investigation Board for Bradford and district, and the investigations which are in progress elsewhere in connection with anthrax sterilization, and the quantities of anthrax bearing materials which are offered for export, it is hoped that some practicable process for general adoption will soon be solved. I might add that it has been stated also that sufficient evidence has been collected to warrant the supposition that animal food stuffs imported into Great Britain receive contagion in shipping, from association with hides, skins, wool, and hair; therefore it would seem probable that nearly all of the agricultural risk from anthrax can be eliminated if animal food stuffs are not placed in the neighborhood of such materials until after thorough treatment of the infected material at the port of shipment, by means of some practicable and efficient sterilizing process.

I am pleased, in conclusion, gentlemen, to invite your attention to the favorable conditions which now exist and which have been in operation during the past several years as a result of the mutuality of interests, the unity of effort, and the reciprocal relations which unite the two great animal industry organizations of this continent, so ably directed by the two preceding presidents of this association. As we contemplate these conditions and circumstances, we are inspired with confidence for the future, and feel justly and reasonably proud not only of our accomplishments, but likewise of our rank and standing among the nations of the world in matters pertaining to animal industry, and sanitary control as related to the contagious diseases of live stock.

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DR. CHARLES H. LEAVITT, Vancouver, Wash., has returned to Manila, P. I.

## ANTHRAX AND TICK FEVER.\*

By W. H. DALRYMPLE, BATON ROUGE, LA.

(Of Committee on Veterinary Sanitary Police Measures).

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(Continued from February Issue.)

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TICK FEVER.—The successful eradication of the common cattle tick from the Southern States, which, necessarily, means more than the suppression of tick fever, is, in my opinion, one of, if not the most important industrial problem confronting that section of our country to-day—for, assuredly, a tick-free South means a new South, agriculturally.

It may interest some of you, at least, to know something of the losses the South has sustained from the presence of the common cattle tick (*Margaropus annulatus*).

Various estimates have been placed upon these losses, and in the Year Book of the United States Department of Agriculture for 1904 they were given at no less than \$100,000,000 annually.

A citizen of my own state, the late Mr. August Mayer, pointed out, in Farmers' Bulletin of the Federal Department of Agriculture, No. 261, that the *direct* loss to the South each year, occasioned by the cattle tick, was not less than \$46,500,000; this loss consisting of the death of cattle from excessive tick-infestation and from Texas or tick fever; and the loss in flesh by both beef and dairy cattle due to the drain upon them by the tick.

In addition to this direct loss, Mr. Mayer also pointed out that the *indirect* loss occasioned by the greater length of time required for cattle to mature when the tick had to be contended with, and the failure of Southern cattle to even approximate the average valuation of cattle in the tick-free states, amounted to the additional sum of \$84,000,000 a year.

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\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

In short, the losses chargeable to the presence of the cattle tick in the South, Mr. Mayer roughly summarized as follows:

1. Death from tick fever of pure-bred cattle imported from the North for breeding purposes.

2. Death from tick fever when cattle raised in isolated tick-free areas were unintentionally, or accidentally, placed with ticky cattle, or on tick-infested areas.

3. Death of native cattle from excessive parasitism and fever occasioned by the ticks.

4. Universal loss of weight by all tick-infested cattle, and their failure to gain flesh at a rate great enough to make beef production profitable (to this might have been added, decrease in the production of milk in dairy cattle).

5. The lower price which Southern cattle brought upon the market, regardless of how perfect their condition might be.

6. Sterility induced in high-grade cattle by tick-infestation.

7. The expense of maintaining a Federal quarantine line for the protection of the North against invasion by the tick, and the added expense of maintaining quarantine pens for Southern cattle shipped North for slaughter.

8. The discouraging effect on the breeding of pure-bred cattle in the South by reason of Southern breeders not being allowed to exhibit in Northern show rings. And,

- 9—But by no means least, the potential loss of fertility of Southern farm lands, due to a one-crop system (cotton) which, with the tick eradicated, would quickly give way to a diversified agriculture, which would conserve and increase the fertility of Southern soils.

From the foregoing summary, I do not think it would require a very great stretch of the imagination to fully appreciate the apparently enormous figures representing the amount of money which the South has been paying tribute to the cattle tick, annually, for lo! these many years. Nor should it be difficult to realize that, in lending its valuable effort towards the ultimate extermination of this pest, and with it the deadly bovine tick fever, the Federal Government has undertaken to assist in one

of the most benign and important pieces of industrial work for the South, and, incidentally, for other sections of the country, that is possible of conjecture.

A very brief history of the beginnings of the tick eradication work in the South may be of interest:

Following a conference of Southern gentlemen interested in this movement, including some of the most prominent members of the profession in the South, with representatives of the National Bureau of Animal Industry, it was decided to take the matter up with Southern senators and representatives in Washington with the view of obtaining Federal aid through Congressional appropriation.

Subsequently, in the spring of 1906, a measure was introduced by Congressman Joseph E. Ransdell, of Louisiana, carrying an appropriation of \$100,000 for tick eradication.

During the committee stage of the proceedings however, a hearing before the House Committee on Agriculture had been arranged by Mr. Ransdell in behalf of the measure, and at which were present Secretary Wilson himself, Dr. A. D. Melvin, and others of the Bureau of Animal Industry, a number of delegates from the Southern States, and several interested members of the Senate and House.

Suffice it to say that the appeals, as a whole, made in behalf of the measure were so forceful and convincing that the amount asked for was recommended by the committee, and \$100,000 obtained for this work—or, more correctly, \$82,500, the remainder going to another bureau more or less allied with the project.

The second appropriation amounted to \$150,000, and the annual appropriation since then has been \$250,000.

These moneys have been appropriated on the "help those who help themselves" basis. That is to say, it was most emphatically stated by the Chairman of the Committee on Agriculture that only those tick-infested Southern States which showed a desire to help themselves would receive assistance from the national Department of Agriculture, which the Congressional appropriation made possible—this assistance taking the form of

veterinary inspectors of the Bureau of Animal Industry; and the extent of this aid hypothecated on the amount of state or other local effort put forth.

Since this work commenced co-operatively, by the Bureau of Animal Industry and those states which showed a willingness, or were prepared to undertake their share, over 143,000 square miles of previously infested Southern territory have been absolutely freed of cattle ticks and placed above the Federal quarantine line. And this, notwithstanding the cruder methods adopted, and in spite of much unreasonable, but natural, opposition to the work in its initial stages. In the face of all the drawbacks, however, and in spite of the "pullbacks" in human form, that such an extensive area should have been cleared of these expensive pests in the comparatively short space of time, since the inauguration of the work, constitutes nothing short of a splendid record, even if it has cost the Federal Government in the neighborhood of a million of dollars to date. In fact, I think it questionable if a similar amount of money could have been spent in any other cause that will yield such returns, not only to the South but to the country at large, in the years to come. And, while we are glad to be able to send some of our best Western farmers over the border to help our Canadian friends out, the eradication of the cattle tick from the South will open up to general agriculture and stock raising the most promising section of our own country to this desirable class of citizenry, and thereby tend to retain them under the fluttering folds of "Old Glory," instead of under those of the "Union Jack." Although, Mr. Chairman, from the splendid protection this latter "old rag" affords the world-wide citizenship over which it floats, it is by no means to be despised.

But although the progress already made in tick eradication is most encouraging, later methods, and the experience gained in the past, will hasten very materially the completion of the work, and to which I will briefly allude before I close.

Mr. Chairman, the problem of tick fever simply resolves itself down to the proposition of killing cattle ticks. We seem

to care little now about the theoretical side of this disease, but are rather bending our efforts toward the total extermination of one of the obligate hosts of the organism which produces it, and thereby make impossible the completion of the cycle of its existence. And we are going to win!

Before referring to the later methods adopted in the campaign, it may be of interest to some of the members present to say just a word concerning the active cause of this fever and its parasitic host—the common cattle tick: Tick fever is, in reality, a piroplasmosis, and is brought about by a two-host protozoan, the *Piroplasma bigeminum*. This organism requires, for the completion of its life-cycle, two hosts, which are, in its case, the bovine animal and, in this country at least, the common cattle tick (*Margaropus annulatus*).

In some other countries other names are applied to the disease, such as bovine malaria, red-water, etc., and other species of ticks may act the part of second host.

But in no case, so far as we know, will the organism complete its development in the absence of one or other of its hosts—they are obligate.

Consequently, in order to prevent completion of the life-cycle of this organism, we destroy one of its obligate hosts, which, as may be inferred, is, in our case, the common cattle tick.

So that in short, our object in killing cattle ticks is not only to break the life-cycle of the protozoan, but prevent the fever by destroying the host which, in the seed-tick stage, transmits it to the bovine.

I believe I am correct in the statement that the common cattle tick is the only one, in this country, at all events, which completes its development on the body of its host after it attaches itself in the seed-tick stage; molting twice, and going through the process of fertilization during that period.

In the Gulf States, at least, the period from the time the seed tick attaches to its host until the engorged and fertilized female drops to the ground to deposit her eggs, is, on an average, 22 days.

The eggs deposited may be from 1,500 to 4,500, or more, after which the mother-tick dies.

In midsummer the eggs hatch in from 17 or 18 to 30 days, and the seed-ticks almost immediately crawl up the nearest weed or blade of grass and bunch together near the top, where they await the first passing animal; and where the development on the host, as stated, commences. In 22 days the female, fertilized and engorged with blood, drops to the ground for egg deposition; and this continues, in the case of millions of these parasites, all during the summer season.

In cold weather the eggs do not hatch, but usually remain over until the coming of the warm days of spring.

The above is but a very brief life-history of the cattle tick, which I have given in order that you might more readily appreciate the application of what I have termed the later methods in the work of eradication. These are—the concrete dipping vat; the standard arsenical dipping solution, composed of common white arsenic, ordinary sodium carbonate, pine tar, and water; and the dipping of the cattle regularly every 21 days (some dip every two weeks).

The method is not only eminently effective, but simplicity itself. The cattle themselves gather the ticks from the pasture, and every 21 days during the summer months bring them to the dipping-vat to be killed by the arsenical solution. The 21-day dipping periods insure that none of the large female ticks will have dropped from the cattle to the ground to make more seed-ticks, which they would do if left for 22 days or over, but all that have accumulated on the animal, between dippings, are brought to the vat to be destroyed.

In this way the pasture is ultimately cleaned of ticks, and the number on the animal much reduced at each dipping, until they are exterminated from the place.

Incidentally it might be mentioned here that not only does the dipping process effectually kill cattle ticks, but millions of those miserable little irritating horn-flies are destroyed in the solution; and it is the experience of those who have been using

the dipping vat for some time that where cattle are dipped regularly, "warbles," or "wolves," in their backs are almost unknown, which means a considerable saving in the value of hides, and the leather made from them.

The dipping vat has made many converts to the work and brought about co-operation, rather than opposition which previous methods such as hand-greasing of the cattle, laying pastures out of commission in order to kill ticks by the starvation process, etc., had created in those who could not appreciate the benefits to be had from tick-freedom, and who never had had any means of comparison between what then obtained and that which might be brought about, if only the ticks were gone.

In my own immediate neighborhood, comprising three parishes, or counties, the work has taken an almost unprecedented spurt; 30 or 40, probably more, vats having been constructed, solely at individual expense, and for the benefit of the neighbors as well as the individuals owning them. Dipping is going on regularly; vats are now considered a permanent necessity on the farm for all kinds of live stock, and the destruction of the external parasites that prey upon them. The benefits are so apparent, even after two or three dippings, that the thing is becoming contagious among the people. They talk about the dipping vat; tell their neighbors about it; praise its good work on every available occasion. In short, are simply delighted with the results. And that, too, in the particular instance I speak of, without any monetary assistance from either local or state authority.

The movement was started in a voluntary way. No one was required to dip, and no restrictions were placed on the movement of cattle. Several of our more intelligent cattle owners simply acted upon our suggestion, after a little campaigning, and built vats. Others either followed suit, or took advantage of those vats already constructed. Invitations were sent out by the owners of vats to the neighbors to come and witness a dipping demonstration. It did not take many of such demonstrations to prove to them the effectiveness of the process.

In the neighborhood of the vats all opposition has melted away, and the "standbacks" on the outside are gradually losing their native inherent opposition to things progressive and are falling into line. And, as the result of what has already been accomplished in my immediate vicinity, and solely by individual effort and expense on the part of a number of cattle owners themselves since about the middle of May last, we have been able to obtain the assignment of an experienced veterinary inspector of the Bureau of Animal Industry to assist and encourage our people in a work which means so much to them, and to the whole South, in an agricultural and industrial way.

Finally, Mr. Chairman, for my paper is already much too long, this work of tick eradication, and along with it the deadly tick fever, from the South is no longer looked upon as merely cleaning a cow of ticks in the interest of the individual cow owner. It is already being considered a great commercial proposition.

The big transportation corporations of the country doing business in the South have caught the slogan, "Get rid of the ticks," and are assisting the work by printing and distributing all along the Southern lines of their roads elaborately illustrated pamphlets on tick eradication. They have now come to realize that, in order to secure maximum business in the haulage of cattle and other live stock and farm products generally to and from a section of country so admirably adapted by nature, and in other respects for successful agriculture, in all of its branches, the tick must go! And, when these wealthy corporations fully appreciate the fact, viz., that the cattle tick in the South interferes with the size of their dividends, which, apparently, they have already done, then the tick has simply got to "get a move on"; "that's all their is to it."

It would seem, then, that in a very few years' time we will not only be able to keep our own citizens from crossing the northern border in search of a livelihood, but possibly tempt South some of our Canadian friends to help us develop one of the grandest agricultural and stock-raising sections of country on the American continent.

## THE IMPORTANCE OF HOG CHOLERA AND THE PRODUCTION OF HOG CHOLERA SERUM.\*

BY F. A. BOLSER, V.S., NEW CASTLE, IND.

*(Continued from February Issue.)*

**TREATMENT AND PREVENTION.**—There is no successful treatment for hogs sick with cholera. Various products have been recommended for this purpose but are of no practical value. The only rational way of dealing with an epizootic is to prevent the spread of the infection instead of attempting to cure those animals already sick. Since there can be no cholera without the filterable virus, every precaution should be taken to prevent its being carried to sound herds. After the disease has appeared in a herd, the only known remedy that will prevent its spread is the Dorset-Niles anti-hog cholera serum. This preparation will prevent the infection of other members of the herd if used in the early part of an epizootic. Besides administering serum, pens, troughs, and yards should be thoroughly cleaned and disinfected, so that the infection cannot be carried to other places.

**PRODUCTION OF SERUM.**—Since the filterable virus could not be grown artificially, it was necessary to resort to the blood of hogs sick with cholera for any protective agent. On this account many attempts were made to produce a vaccine at attenuating the blood of sick animals. The results attained by such attenuation were too uncertain for general use. While endeavoring to produce a vaccine, it was noticed that by injecting an immune animal with large amounts of virulent blood, a serum of high protective powers could be obtained.

In order to produce anti-hog cholera serum it is necessary to have an immune animal. For this purpose a pig is immunized

\* Presented at the Forty-eighth Annual Convention of the American Veterinary Medical Association, Toronto, Can., August, 1911.

by inoculation with a few centimeters of virulent blood and an injection of anti-hog cholera serum in opposite sides of the body. Then the immune is hyperimmunized by the injection of virulent blood. The large amounts of virulent blood required are obtained as follows: A few centimeters of virulent blood are injected into susceptible pigs. When these animals are in the last stages of the disease, they are bled under antiseptic conditions, the blood defibrinated by shaking with glass beads, and strained through sterile gauze. To produce potent serum a strong virus is necessary, that is, one that kills quickly. Otherwise the serum produced would be weak in protective properties. We may hyperimmunize in any of the following ways:

1. Slow subcutaneous. Inject the immune animal subcutaneously with 1 c.c. per pound of body weight. In from seven to ten days repeat the injection using  $2\frac{1}{2}$  c.c. per pound. Then after the same interval inject 5 c.c. per pound.
2. Quick subcutaneous. Inject 10 c.c. per pound of body weight.
3. Inject intravenously 5 c.c. per pound.
4. Intra-abdominal. Inject intra-abdominally 10 c.c. per pound of body weight.

As soon as the animal has recovered from the effects of the injection or the last injection, if the slow subcutaneous method has been used, it is ready to begin bleeding from the tail. This is usually within ten days. The bleeding is repeated at intervals of a week for three or four weeks. The animal is then killed and all its blood used, or it may be rehyperimmunized. In rehyperimmunizing the animal usually receives half the previous dose of virulent blood. Four or five cubic centimeters of blood per pound of body weight are usually taken at each bleeding. Sometimes an animal will not bleed so much and occasionally it is possible to take more. A two hundred pound hog will in most cases give 800 to 1,000 c.c. of blood at each bleeding.

**TREATMENT OF THE BLOOD.**—The blood is drawn from the tail under as antiseptic condition as possible. It is then defibrinated or the clots broken up by shaking with glass beads, then

strained through sterile gauze to remove the clots. One half per cent. of phenol is added and the serum is ready for use. The blood of each animal is kept separate and that of each bleeding added. The mixed blood of several animals is tested before using.

**TESTING THE SERUM.**—The following methods of standardizing hog cholera virus and testing the potency of the serum were adopted at a conference of the Federal and State officials in December, 1909:

1. The standardization of hog cholera virus which is used for hyperimmunization.

A. Inject at least two pigs intramuscularly, giving each 2 c.c. of the defibrinated diseased blood which is to be tested. The blood should not be more than 24 hours old and should have been kept at a temperature not higher than 55° F.

B. The test pigs should not weigh less than 50 pounds each. After injection they should be placed in a small disinfected pen with at least one susceptible uninoculated pig of the same weight and preferably of the same litter.

C. The virus shall not be considered suitable for use unless the inoculated pigs become visibly ill within eight days and die within fifteen days after inoculation. The carcasses of these pigs must show undoubted lesions of hog cholera. Furthermore, the communicability of the disease induced by the blood inoculations must be demonstrated by the contraction of the disease by the check pig within 12 days after the appearance of the disease in the inoculated pigs.

2. Handling the blood used for hyperimmunization. The diseased blood should be collected and manipulated under strict antiseptic precautions, stored in a temperature not higher than 55° F. and used within 24 hours after drawing. It is recommended that defibrination be postponed until immediately before use of the blood.

3. Testing the potency of the hyperimmune serum.

A. If the plan of testing the mixed bleedings of each hy-

perimmune be adopted by the producer, then we recommend that the test be carried out as follows:

Inoculate three hogs, each weighing from 50 to 100 pounds, with 2 c.c. each of virulent blood. Inject two of these simultaneously with 15 c.c. each of the serum to be tested. If the hog receiving virulent blood only sickens with hog cholera within eight days and is apparently ready to die in fifteen days, while the two receiving immunized serum continue in good health, then the serum may be considered suitable for field use in doses of 20 c.c. for hogs weighing from 50 to 100 pounds.

B. If the plan of testing the mixed sera of several hyper-immunes be adopted by the producer, then inject intra-muscularly nine similar hogs weighing from 50 to 100 pounds each with 2 c.c. each of virulent blood. Give each of three of these 15 c.c. of the immunizing serum to be tested. Give each of three others 20 c.c. of the serum to be tested. If all of those receiving immunizing serum remain in good health and two or more of the checks become ill of cholera within eight days and are apparently going to die in fifteen days, the serum shall be considered suitable for field uses in doses of 20 c.c. for hogs weighing from 50 to 100 pounds. If one or more of the pigs receiving 20 c.c. each of the immunizing serum all continue to remain in good health, then the serum may be used in field work in increased doses.

**METHODS OF USING SERUM.**—There are two methods of using the serum. By the simultaneous method a dose of serum and a small amount of virulent blood are injected into the opposite sides of the body. This method of vaccination is said to produce an immunity that will last for life. It is to be preferred in cases of well herds and in those that will not be exposed to the disease for several months. This involves the use of virulent blood which if handled carelessly may furnish the source of infection to well herds.

Serum only is injected in the other method. This serum will produce an immunity that will last for several weeks or months, but if the animals are not exposed to cholera within a

few weeks after receiving the serum, the immunity is believed to be of a lasting duration. In either case the injection is usually made in the inside of the thigh. Where natural exposure to the infection takes place, the virus is not needed. The serum should be administered by a competent veterinarian under strict antiseptic precautions.

Our experience in eighteen months with Dorset-Niles method of serum treatment in treating hogs affected and vaccinating those not affected amounting to between 5,000 and 6,000 head a majority of herds were infected, and we saved 85 per cent. of the hogs treated and vaccinated. Have vaccinated pigs one day old, using 1 minim of virus blood and 10 m. hyperimmune serum. At weaning time we revaccinated and did not lose a pig. This was on a farm that was infected, but the mother had been immune. I believe from the experience just passed through, that pigs can be carried through on infected farms in this way, but while vaccinating while small, we are compelled to revaccinate when pigs weigh from 60 to 75 pounds.

In four herds on infected farms I carried the pigs through in this way. In most cases, however, I vaccinated the pigs at about 10 pounds the first time, using 3 minims virus blood and 2 c.c. serum. On two infected farms I could not get serum to revaccinate for three weeks after the required time, and in both instances the pigs became infected and on one farm there was a loss of 15 per cent. before I recovered the serum. Pigs weighed about 75 pounds. I used from 40 to 75 c.c. serum owing to the infection. Only lost 15 per cent. of the remaining pigs. I don't think one should treat small pigs that are infected; they do not have the vitality.

All animals in affected districts should have temperature taken before vaccination, and in territories where you are first commencing the work, one should not treat those having a temperature of more than 104. However, in aged hogs, weighing from 150 pounds up, you can save at least 60 per cent., but a loss of 40 per cent. in new territory will do the profession more harm than the saving of 60 per cent. will do good. A great secret in

treating infected herds is in using enough serum. I have used as much as 300 c.c. on male hog weighing 600 pounds, and am satisfied that saved the animal.

Our experience in vaccinating sows just before time to farrow has not been good. The sows were immune, but in four herds the pigs came with lumps on them, some scoury, some lame, others coughing, and in one herd three of four pigs came dead in almost every litter. In herds that are vaccinated just after having been bred, or first two or three weeks, the result was different. Pigs came all right, and were vaccinated at about 8 or 10 pounds weight. I want to insist that you should not use either serum or blood that has not been tested. I do not think that any state or nation should permit the use of either unless controlled by Bureau of Animal Industry, State Veterinary Board, or at least under state control. The demand is too great, making the sale hazardous, unless under such control.

There is not one single disease coming under the veterinarian's observation where the people are so readily swindled as in hog cholera remedies. In localities where the serum has proven beyond doubt its merit, the stock men will try every obnoxious remedy presented to them. They have been beaten so often that it has become a part of their nature, and it has become impossible for them to resist. Hence it is the duty of every veterinary surgeon, living in territory where hogs are grown, to put forth every effort to the education and enlightenment of his clients. Showing them that at last, after years of research, by the most able of our profession, we have a serum that will save the hogs from cholera. In Indiana, up to the middle of August, 1911, there was reported to Dr. Craigg, in charge of the experimental station, 188 herds vaccinated and treated, 75 herds were non-infected, 115 infected. Of those 75 non-infected herds, which contained 4,906 hogs, 51 herds had no loss from vaccination; the other herd loss 104, or a percentage of 2.25 per cent.

Of the 115 infected herds, which contained 8,071 hogs, 25 herds had no loss after treatment, the other 90 lost 765; or a loss of 9.50 per cent. Dr. Craigg informs me that over 50,000 head

have been treated and vaccinated in Indiana up to date, and at about the same ration.

To those of you who do not live in territory where swine are grown, this cannot appear of very great interest. But there is not a man, woman, or child living, who would not be benefited by the stamping out of hog cholera.

State of New York—Department of Agriculture.

ALBANY, January 15, 1912.

Hon. JOHN A. DIX.

*Governor of New York,*

*Executive Chamber, Albany, N. Y.:*

DEAR SIR—As indicated in my conversation with you some days ago, I hereby resign as Commissioner of Agriculture, effective February 16 or as soon thereafter as my successor shall qualify. If my successor desires to have my advice or assistance in becoming acquainted with his new duties, he will be welcome to all the help I can give him.

For a long time I have wished to make a study of certain agricultural conditions in Europe and I have decided to undertake this study at an early date.

It has been a great privilege to me to serve as Commissioner of Agriculture since April, 1908, and during a time when changes in the interest of better agriculture have been so marked. For your kind consideration, often shown to me both in an official and personal way, I express my most grateful thanks, and I wish you all success in the administration of your great office.

I am

Very truly yours,

(Sgd.) R. A. PEARSON,  
*Commissioner.*

State of New York—Executive Chamber.

ALBANY, January 16, 1912.

Hon. RAYMOND A. PEARSON,

*Department of Agriculture, Albany, N. Y.*

DEAR MR. PEARSON—In accepting your resignation as Commissioner of Agriculture I desire to state that you have performed the duties of that responsible position in an intelligent and efficient manner which reflects credit upon that greatest of all industries, agriculture.

Your qualifications have fitted you to meet the trying conditions promptly and well. Much has been accomplished in the advancement of all the departments, especially that of giving instruction, and I desire to add my word of commendation for the service you have performed.

I believe you are inspired by the right idea when you take up the study of agricultural conditions in foreign countries, where intensive farming has been practiced for generations. Thickly populated countries have been compelled to get a greater yield per acre than we have felt the necessity of accomplishing here. But the rapid increase of inhabitants has presented to us conditions to be met and problems to be solved without further delay. And I believe you can perform no greater public service than by studying conditions and methods abroad with an idea of helping to solve these problems.

Wishing you the best of success, and with expressions of my high regard,  
I am,

Very truly yours,

(Sgd.) JOHN A. DIX.

## A WINTER DISEASE.\*

BY DAVID W. COCHRAN, D.V.S., NEW YORK, N. Y.

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The subject of the paper which I have chosen to be read and discussed this evening is what is ordinarily called "A Winter Disease." It is commonly called Scratches, Mud Fever or Snow Poisoning. It admits of a very wide scope for consideration. There are two principal causes, traumatism and constitutional disturbances. It is an acute or chronic inflammation of the skin, connective tissues, sheaths of tendons, coats of blood vessels, lymphatics, nerves and synovial membranes located in the region of the pasterns or fetlocks, and in some cases extends up the entire length of the limb.

*Causes.*—One of the first causes I will mention is clipping the horse's pasterns or fetlocks; the parts are robbed of their natural warmth, the silkiness of the hair has been removed and hard stumps or bristles left, which act as irritants, causing flexion crevices through which micro-organisms gain admission to the locality. Secondly, they often follow as the sequelæ of some debilitating disease where the vitality of the parts have been lowered through impaired nutrition or sluggish circulation.

*Varieties.*—We may have an erythema, an eczema-wound infection, followed by erysipelatous cellulitis, ulcers, elephantiasis, synovitis, keloids, or we may classify them under one head and call them "Dermatitis," a general term used to designate an undefined and extensive group of symptomatic inflammations of the skin, characterized clinically by heat, swelling, pain and terminating either in resolution or suppuration, gangrene or chronic dermatitis. In defining the several forms, we will begin first with *erythema*. It is an acute inflammatory condition of the skin, generally of short duration, characterized by slight congestion,

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\* Presented at the February Meeting of the Veterinary Medical Association of New York City.

redness, swelling and with marked stiffness or lameness, pain, occasionally terminating as vesicles or blebs. It is called by some an erysipelatous condition; we may have a suppurative capillary phlebitis. In eczema we have the same conditions, more intensified. The skin is fissured with crevices, leathery infiltrations and scaling. We have an exudate of plasmic fluid, which weeps for several days; we have fissures or flexion crevices, characterized by deep, painful cracks in the skin. These often end in an eschar—the crust or disorganized portion arising from the mortification of the part. The inflammation which it excites in the contiguous parts give occasion to the secretion of pus between the living and dead parts, which ultimately completely separates the latter. This process is called “sloughing.” We then have after the slough the lameness subsiding; or we may have an ichor-hæmia, a disease condition with a thin, aqueous and acrid discharge due to the presence of corrupted or vitiated humors in the blood. We may have the inflammation affecting the lymphatic system (the skin and its capillaries are affected, coagulation of lymph within the vessels takes place, closing up the channels). The coagulation may become organized hyperplasia of cells and consequent swelling and thickening.

*Elephantiasis* consists of a hypertrophy of all the structures of which the integumentary covering of the leg is composed. The epidermis becomes thickened, roughened and intersected with fissures. The dermis is thickened and the subcutaneous tissue is infiltrated with a gelatinous material, which often oozes out of the skin. It is due to engorgement of the lymphatics, together with a phlebitis, a periphlebitis and hardening of the cellular tissue.

*Thecal Abscess.*—We have thecitis resulting from inflammation of the sheath of tendon. The pain is most severe, pus is formed and confined and burrows into the bursæ of the joint. The foot is held some distance from the floor in a forward direction and is kept in constant motion, from pain. When forced to move he will hop with difficulty on the sound leg. On examining for the cause, one which is very difficult on account of the

irritability of the patient, we may find a pinhole opening in the hollow of the fetlock; if we insert a probe, it will descend down to the tendon sheath. These abscesses are attended with grave consequences that either prove fatal or run a troublesome course of long duration. Another course is that of *phlegmonous cellulitis*, or *phlegmonous erysipelas*. This is characterized by the spreading of a purulent or a fibrino-purulent exudate within the subcutaneous tissues. It is a passive congestion met with in undermined portions of the skin, which have been deprived of their direct arterial supply. This may extend the whole length of the limb, and be attended with large sloughs in several places, often exposing the bloodvessels and tendons along their course. Another affection very nearly of the same nature may be described as *gangrenous dermatitis*.

*Gangrenous dermatitis* is a striking example of gangrene resulting from a slight injury. It is a true mycotic gangrene. The skin becomes swollen and stasis is formed and blocked with micro-organisms. There is a loss of circulation in the capillaries. It sometimes follows a simple abrasion, as a flexion crevice, that allows the micro-organisms to enter the cellular tissue. They generally enter into the gangrenous process after some other action has interfered with the nutrition of the affected part. The early manifestation of gangrene is intense pain, severe lameness for several days; following this the skin becomes cold, moist and sweaty; finally sheds the hair at the affected part. There is a very offensive smell. After a few days the slough falls off and leaves a granulating surface. The wound heals without further event and leaves a hairless scar and permanent blemish; or we may have left a certain amount of œdema of a certain character, which is caused by a production of new connective tissue that often remains as a permanent tumefaction of the leg.

Another condition to which I wish to call your attention is that of keloids. This is a term applied to an overgrowth of scar tissue; also to a fibrous outgrowth of skin of a similar character, apparently spontaneous in origin, though most often traceable to wound infection. They are seen where the skin is not firmly at-

tached to the subadjacent tissues. The cellular tissue takes on great activity and the insignificant lesion of the beginning becomes a voluminous tumor that is very hard and vascular. This tumor may have several isolated enlargements. The growths will be prolific in portions. The nerves and bloodvessels and tendons are drowned in a fibrous tissue, which is the zone of attachment of the neoplasm.

*Pathology.*—Without going into detail about the different forms of micro-organisms, I will say the first effect of cold is to cause a contraction of all the parts acted upon. The small arteries of the skin become so narrowed that the circulation through the parts is completely arrested. The cellular elements become benumbed. The vitality of the part will be greatly lowered and finally extinguished. So long as the parts are bloodless, inflammation cannot manifest itself, but as soon as the vessels dilate on the restoration of natural heat of the part, inflammatory phenomena occur, varying with the degree of impairment of the vitality that the part has suffered during the exposure to cold. If the vitality has been destroyed, the blood fails to enter the vessels of the dead part and decomposition sets in; on the other hand, if from the sudden thawing of the frozen part a large quantity of blood is admitted, inflammation takes place. Exudation occurs in the damaged vessels, great swelling and tension ensue, and the circulation may again be arrested, and a part which has escaped death from the direct action of cold may rapidly become gangrenous after a short period of apparent restoration. If it escapes gangrene, the inflammation gradually subsides, after being accompanied by vesication. This process of chemical and physiological change, which is essential to every manifestation of life, being *only possible within certain very narrow limits of temperature*, is hindered or absolutely prevented.

In inflammation of the lymphatic structure we have both the acute and chronic forms. Acute inflammation may result from traumatism—extension of inflammation from infected wounds. In the chronic type the lymphatics may undergo fatty, caseous or calcareous degenerations—inflammatory conditions of tissue. We

may have tumefaction, due to the excessive supply of blood furnished by the dilated capillary vessels, and frequently to an accompanying oedema of the inflamed tissues. The duration depends on an abnormal connective tissue, cell growth and its organization and development into new tissue. Inflammatory indurations are slowly removed by nature through absorption. Suppuration of tissues may be a circumscribed process of destruction; it may accompany a superficial ulceration or granulative process. Circumscribed pus may exist as acute or chronic abscess, often followed by a suppurative inflammation of the lymphatic glands.

*Ulceration of Tissue.*—By an ulcer is meant a superficial solution of continuity of soft tissues dependent on a molecular death. This process can never exist within the substance of any tissue. It is essentially a condition of the surface. Ulceration effects cutaneous and mucous surfaces of the body. It may be the result of enfeebled circulation or defective nutrition from lack of blood, as is found in hind extremities, and in direct inflammation of an intense character, due to traumatism or infection. In ulcers we have a progressive destruction of the tissues, in which the solid parts seem to melt away into a liquid discharge without the separation of visible portions of dead tissue, as if a piece of skin be killed in any way, as by the application of some caustic or mechanical violence; there is at first no solution of continuity; the dead tissue is everywhere continuous with the living; but within a short time the phenomenon of inflammation manifests itself in the surrounding living tissues, thus imperfectly marking out the limits of the part that is killed. By the second or third day the line between the living and dead becomes more clearly defined. The skin at the margin of the living part becomes loose and is raised by a fluid beneath it, and at last comes away, exposing a raw surface, discharging pus. The living tissue which lies in immediate contact with the dead seems to melt away into the purulent discharge, till a complete solution of continuity is established. The dead part, or, as it is called, the slough, is separated from the parts beneath at the expense of the living tissues. The

irritant having acted on a limited portion of the living tissue with sufficient intensity to cause a retarded flow in the vessels, culminating in stasis and death in the parts *most directly acted upon*. Ulceration is in many cases simply a further stage of pustulation. Pustulation occurs in the first stage, but the irritant being so powerful that necrosis follows and the epidermis is involved in the necrotic process. In this way vesiculation, pustulation and ulceration may be regarded as stages in a single process. On the other hand, ulceration may occur with little or no preceding suppuration, as the result of a nerve lesion, due to trophic influences which determine the nutrition of the area supplied.

*Treatment.*—The essential phenomena of inflammation are: 1. The dilation of the arteries with increased blood pressure in the area supplied by the dilated vessels. 2. The exudation through the damaged walls, other things being equal, will be proportionate to the degree of intravascular pressure. 3. The migration of the white blood corpuscles. 4. The complete arrest of the circulation by stasis.

Acute inflammation is identical in all cases. It may vary in degree, in extent and in termination, according to the nature of the cause and the vitality of the tissues on which the cause is acting, but the process is always the same. When, therefore, varieties of inflammation are spoken of, the variations do not depend on differences in the essential nature of the process, in so far as changes within the vessels and the exudation are concerned, but are the results of variations in the cause and in the degree to which the vessels and other tissues are damaged by it. The vascular dilation and exudation cause the inflammatory swelling and give rise to tension, which, acting as a fresh source of irritation, aggravates the inflammatory process. One of the primary objects in treating inflammation is, therefore, to limit the exudation by diminishing the blood pressure, and, failing in that, to relieve the tension it gives rise to, both by local and constitutional means; but as an increased supply of blood lies at the bottom of most surgical processes, no process by which the separation of dead parts are affected or by which the repair of wounds or ulcers are car-

ried out can occur without it. In infective inflammations the fever may be due to contamination of the blood by the presence of some poison from the outside—a micro-organism which multiplies presumably in the blood. The multiplication of the poison in the body and the effect produced (not being proportional to the original quantity inoculated) has suggested that the poison is further developed by a ferment.

I am not acquainted at the present time with any procedure which would definitely destroy the poison in such cases. We must rely on the important place of treatment to tide our patient over this infection.

The local treatment should be warm, moist, antiseptic cataplasms. They are of great assistance in treating inflammation. Tension is relieved, effusion favored and overdilated vessels relieved. They are useful when suppuration is threatened, and hasten the slough. The general plan of treatment, therefore, will be antiseptic. Further details in the *modus operandi* I will leave for discussion by the members of the association.

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PRESIDENT BRENTON, of the A. V. M. A., writes very encouragingly of the outlook of the coming meeting in Indiana. He says the resident secretaries are unusually active, the local committee have their arrangements well in hand, and he is looking forward to a banner meeting next August. He enjoyed a very successful meeting in his own State in the early part of last month.

“THE HORSELESS AGE.” (?)—Two of the water towers were sent to Nassau street, near Pine. One was the old-fashioned horse-drawn vehicle, while the other was the new automobile water tower. By some strange freak of fortune the motor apparatus, which is supposed to be the last word in the matter of water towers, went out of commission early in the day, while the older piece of apparatus continued to give valiant service. Both were sheathed so heavily in ice as to look like the spars of some unlucky vessel cast away and abandoned in the Polar seas.—(From the *New York Herald's* report, January 10, of the Equitable fire in New York City.)

## CANINE RABIES.

BY OSCAR SCHRECK, M.D.V., NEW HAVEN, CONN.

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SYNONYMS.—Canine madness, *Rabidus canis*, lyssa and hydrophobia.

DEFINITION.—Rabies is an acute infectious disease, affecting the cerebral and medullary nervous centres, and characterized by intellectual, emotional, aggressive and other nervous disorders, and by extreme reflex excitability.

ANIMALS SUSCEPTIBLE.—While the disease is seen most frequently in the canine races (dogs, wolves, foxes and jackals) and in the cat family (cat, lion), it is liable to spread widely among animals that use the teeth as weapons of offense and such as can readily attack. When inoculated, all warm-blooded animals contract the disease; man suffers mainly through the attacks of dogs, cats and, in certain localities, wolves and hyenas, but he is also liable to become affected from handling rabid domestic animals. Different animals differ in the susceptibility, the receptivity being apparently greatest in the carnivora.

GEOGRAPHICAL DISTRIBUTION.—Rabies is confined to no country nor climate, but it attains its greatest prevalence in the north temperate zone where there is the densest population and when the activity of travel favors the propagation of infection.

The facility for inoculation is the one determining cause, and, again, where the muzzling of all dogs has been rigidly enforced, as in many German cities and districts, the disease has been practically extirpated.

ETIOLOGY.—Long before the days of bacteriology, rabies was recognized by veterinarians as a disease due to infection alone; its absence from the various countries, its rapid propagation in other countries into which it had been introduced for the first time, and its restriction and disappearance where muzzling had been strictly carried out, had practically settled the question.

**VIRULENT MATTER.**—In 1830, Graner and Count Salm demonstrated the virulent properties of the saliva of the rabid dog. The actual factor which produces rabies is not certainly known, so that we cannot speak of its bacteriology. That it is due to a specific germ is now indisputable. Paul Bert and Nocard filtered the virulent fluid through plaster of paris and found the clear fluid that was passed through *non-virulent*. The virulent agent is, therefore, not a body in solution but a solid (organism) which is held back by the filter. Galtier found that the virulent saliva remained potent for eleven days if preserved from drying; the virus is very resistant to cold, having survived a temperature of 60 degrees for several months.

**INCUBATION.**—The duration of incubation varies with the species and individual, the seat and character of the bite, the amount of virus instilled, the potency of the virus, the age, size, and weight of the subject, the excitement of rutting, climate, or weather, and nervous or febrile disorders. In the dog, the incubation ranges from fifteen to sixty days and perhaps four to six months. It is claimed to have lasted a year, but this is somewhat doubtful; in cats it has varied from fifteen to sixty days. In solipeds it ranges usually from twenty to forty-five days. The extremes stated are fifteen days and twenty months; in cattle it ranges from fourteen to sixty days (exceptionally seventy days).

In man, incubation is alleged to be even more varied, the rule is from fourteen to sixty days, but it is claimed to have been as short as three days and as long as one to twelve years; in the human being, however, there is always the danger of the disease caused by simple dread.

**SYMPTOMS IN THE DOG.**—In dogs, as in other animals, rabies is known by two great types, the furious, and the dumb or paralytic; which, however, usually succeed each other in fully developed cases. Some marked changes in the disposition or habits of the animal is the first obvious variation from health, and in a district or country where rabies exists, any such changes should be the warrant for instant seclusion of the dog before there is a disposition to bite.

The unwonted habit may be of almost any kind; the lively, amiable dog may become suddenly dull; the quiet, unexcitable dog may become unusually affectionate and demonstrative, licking the owner's hands and face and perhaps infecting him before any suspicion is aroused.

The noisy dog may become suddenly silent, while the silent dog may take to howling without apparent cause. A great restlessness or nervousness, or a tendency to start at the slightest sound and a disposition to move frequently in search of an easier position or place to lie in, are most dangerous symptoms. A morbid appetite, with a disposition to pick up and swallow all sorts of non-alimentary objects, straw, thread, cord, paper, pins, nails, coal, marbles, cloth, earth, dung or urine, and in a mature dog, is most suggestive. Searching around, scraping and tearing sticks, cloths and other objects to pieces, licking of smooth, cold stones or metal, are often early phenomena. The dog may hide in a dark corner going to sleep, and grumbling or growling when disturbed; he may make the night hideous with his howls, baying at the moon. He may stand with a dull, melancholy, hopeless expression of countenance, as if beseeching his master for relief from his nameless suffering; but as yet there is no disposition to bite. The dog still responds to the call of his master, but with dullness and in a marked contrast with his usual prompt, alert and loving response. There may be congestion at the seat of the bite and it may be licked or scratched or gnawed until raw, tender and bleeding; also an early change in the voice may be noticeable, or there may be a gradually developing into the rabid howl, which is quite recognizable at a distance and to the educated ear.

**A GRAVE NOTE OF WARNING.**—The apparently sleeping dog suddenly starts up with an air of suspicion and excitement; his eyes may turn after phantom flies or other objects at which he will presently snap; he will move about searching in the dark corners or under curtains or articles of furniture for some imaginary object. If recalled to reality by his master's voice, his healthy attitude and affection may be completely though temporarily restored. In his wandering the rabid dog will swim

rivers, and having no dread of water, just as at home, he will plunge his nose in water though unable to swallow. The furious stage is ushered in by more pronounced manifestations of the above symptoms, and when in this way he exhausts himself by his paroxysms and may perish in one of them, or he may meet his death from man or animal.

In the early stages of the disease the dog walks or trots like any other dog. It is only when exhausted by wandering or violent paroxysms, or both, that he droops his head and ears, hangs the tail between the legs, and slouches along with arched back and unsteady, swaying limbs. The appearance of these last symptoms implies advancing debility and paresis, and the near approach of paraplegia.

**THE DUMB FORM OF RABIES.**—In dumb or paralytic rabies, the striking peculiarity is the omission of the preliminary furious stage, and the disease merges at once into paralysis after the premonitory symptoms; in these cases the early nervous symptoms tend to prostration, weakness and dullness, or even stupor. There is no disposition to escape but rather to seek seclusion and quiet. There is rarely howling and then only at first; and soon there is paralysis of the masseters and dropping of the lower jaw, and there is neither ability or desire to bite. From this the paralysis extends to the hind limbs and then to the fore limbs and trunk; in other cases one limb is the first to suffer, followed by the face, limbs and body. The most prominent feature is the widely opened mouth, the flaccid, hanging tongue and drivelling saliva. The buccal mucosa, at first red and moist, becomes bluish, dry and powdery. The eyes are dull and mournful and suffering, or altogether without expression, and the pupils are usually widely dilated. The hind limbs are usually utterly helpless and often the fore ones as well. The prostration is extreme and the patient lies quiet and helpless until released by death in two or three days.

**DIAGNOSIS.**—The early diagnosis of rabies in the dog is of supreme importance, as enabling the owner to destroy or seclude the dangerous animal before he has developed the disposition to bite and to propagate the disease.

**DIFFERENTIAL DIAGNOSIS.**—The symptoms may be simulated by those of some other disease. Thus the bitch which has been exhausted by lactation may show delirium and a disposition to snap; the presence of a bone or other foreign body fixed between the upper molars, and various injuries of the lower jaws, teeth or throat, may cause inability to swallow, change of the voice, and a morose disposition and expression. In such a case there may be vomiting, as if to disengage something, and salivation, but there is no delirium or fury, muscular weakness or paralysis.

In paralytic rabies, on the other hand, along with open mouth and drivelling saliva, there is no disposition to paw the mouth or face. The buccal mucosa is not simply red but of a deep violet, and there is attendant weakness or paralysis of the hind parts.

Epilepsy is not to be roused by sudden noise. Movements or attempts to swallow are not associated with hyperæsthesia, and the spasms affect the muscular system more generally. Codeac finds rabiform symptoms with disorders of the special senses in animals dosed with various essential oils, but the odor of these essences about the mouth and in the breath would serve to distinguish it.

**THERAPEUTIC TREATMENT.**—That rabies was necessarily fatal, as indeed nearly all developed cases are to the present day, for this reason, and much more on account of the risk of preservation and propagation of the deadly germ, the attempt at curative treatment in the lower animals has been looked on as utterly unwarranted or absolutely criminal.

**PROPHYLAXIS.**—The most effective way of preventing rabies is to eradicate the virus from the country. The enforced muzzling of dogs for a period of one year would almost certainly stamp out the disease. Berlin in 1853 had many cases of rabies and muzzling was enforced, and in three years it was completely eradicated and the city enjoyed nine years of immunity, or so long as the law was enforced.

## WOUND HEALING.\*

BY A. T. KINSLEY, KANSAS CITY, MO.

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The subject of wound healing has been discussed pro and con by various pathologists and practitioners, and it is possible that the subject no longer has its charms for many; however, from the pathologic and therapeutic standpoint, it is apparent there is still much concerning wound healing that is not definitely known, or at least is not put into practice.

A wound may be defined as an interruption of the continuity of tissue or tissues. Some have restricted the term to those conditions resulting from traumatism. Others have confined it to injuries of soft tissues, and still others maintain that wounds occur only upon a surface. There are no good reasons for these restrictions, because thermic and chemic influences produce interruption of tissues which are not unlike and are not distinguished from wounds mechanically inflicted; again, a fracture is a break in the continuity of osseous tissue and is repaired in exactly the same way as in a wound in soft tissue, and further a rupture, as of the liver or the spleen, is characterized by tissue destruction and interruption of the continuity of the integral parts of the injured organ, and if it is not a wound, what is it? Usually the term "wound" is restricted to those injuries that are produced by sudden violent action; thus ulcers and necrotic tubercular centers are not wounds. A bruise may or may not be a wound, depending upon the nature of the lesion; that is, whether or not an interruption of the tissue has been affected.

There are a variety of ways of classifying wounds, of which the following will serve for this discussion: Etiologically, wounds may be traumatic, chemic or thermic. Topographically,

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\* Presented at the Semi-Annual Meeting of the Missouri Valley Veterinary Medical Association, Omaha, Nebraska, July, 1911.

wounds may be surface or subsurface, and again they may be facial, cervical, thoracic, abdominal, etc. According to character, wounds may be incised, punctured, lacerated, contused, as produced by a stab, shot or bullet, or a bite. As to condition, wounds may be infected or non-infected.

Wound healing is the simultaneous regeneration of the tissue complex of an area in which there has been previous destruction. Traumatic wounds usually heal more readily than wounds resulting from thermic or chemic causes, because traumatisms are the result of mechanical force only, and the destructive influence ceases immediately upon removal of the cause, whereas the influence of thermic, and especially chemic, causes continue for a variable period.

Many methods of wound healing have been described, such as • immediate union, primary union, secondary union, tertiary union or intention, healing under a scab, etc. When the exact conditions are understood, it is found that practically all wound healing is of one or two types, primary union or first intention, and healing by secondary union or granulation. Healing by primary union is desired in all wounds. Unfortunately, this method of wound healing is not obtained as frequently as it should be in veterinary practice. The majority of practitioners have thus far not attempted to obtain primary wound healing in any except small surgical wounds. Often surgeons do not properly prepare their fields of operation and do not give the proper care and after-treatment of surgical wounds to favor this type of healing. This is deplorable, and is one of the most frequent causes of condemnation of veterinarians. Why veterinarians do not take more pains to observe antiseptic precautions in their surgical operations is difficult to explain. In talking this matter over with practitioners, most of them make the plea that they have not the time to do aseptic surgery, and that their clientele will not pay for this kind of work. Such surgeons are really to be pitied, for it is indicative of improper understanding of aseptic surgery, as well as showing that they have failed to impress their clientele by their surgical efficiency. If a surgeon will successfully perform two or three

aseptic surgical operations, in which the wounds heal by primary union, he will have no difficulty in obtaining the future cases and a good fee for aseptic surgical operations in the same community. It is not an impossibility and, further, it is not difficult, to obtain primary wound healing even in large lacerated wounds. Certainly, time is required to prepare the wound, but after the first dressing little, if any, attention is then required, and the advantages obtained more than offset the extra time required in placing the wound in such a condition that it will heal by primary union. This type of healing is rapid, and it usually does not leave an unsightly scar; thus the animal is back into service in a very short time. The value of the animal is not depreciated by unsightly scars, but the actual time required of the surgeon is less than it would be if he would have permitted the wound to remain infected and thus require daily treatments.

The other type of healing—that is, by granulation—is the type usually observed in the majority of wounds in the domestic animals. It is this type in which there is a continued infection and a continual destruction of the newly generated tissue, thus necessarily increasing the length of time for the wound gap to be filled with new tissue. This type of wound healing can be obtained by anyone and under any conditions surrounding it. It is certainly no credit to a veterinarian to have under his care several cases of wound healing in which the method of healing is by granulation.

The process of healing by primary union embraces coagulation of the hemorrhage extravasate, agglutination of the wound margins, hyperæmia, inflammation, vascularization, fibrous formation, distintegration of the hemorrhage extravasate and inflammatory exudate, cicatrization, epithelization and substitution, the time required for the latter being much greater than the former.

As previously stated, it is possible to obtain primary healing even in large lacerated wounds, if the wounds are properly prepared by first shaving the hair from all adjacent tissues, then thoroughly cleansing the wound and marginal tissues and remov-

ing all fragments of tissues, after which the wound margins are brought into apposition and maintained in a fixed, immobile position. The method of procedure that should be resorted to in the cleansing of a wound prior to bringing the various parts of it in apposition with sutures or otherwise, depends somewhat on the nature of the wound. In a lacerated wound in which there has been introduced filth, as dirt, fecal matter, hair, etc., the parts should be thoroughly washed with physiologic salt solution until the filth has been entirely removed. The tissue shreds should then be removed by the use of sterile instruments, and some disinfectant used in further cleansing the part. The application of the disinfectant should be again followed by washing with sterile physiologic salt solution, for be it remembered that if disinfectants are applied tissues are destroyed, the extent of which will depend upon the strength of the disinfectant and the length of time of its application; the purpose of the application of the disinfectant is to insure the destruction of all infectious agents, and the object of the application of the salt solution after the disinfectant is to wash away all excess disinfectant, and thus prevent further tissue destruction and remove shreds of tissue that may not have been removed before.

Such treatment of a wound will essentially require considerable time. I have seen some such wound treatment, and in one instance I remember where the irrigation with the salt solution was continued for four or five successive hours, and in this wound some thirty sutures were taken, the wound healed by primary union and the animal was back in service inside of one week. If a lacerated wound has not had filth or infection of any kind introduced; in other words, if it is fresh and clean, then a thorough irrigation for from thirty minutes to two hours with a salt solution is preferred without the application of a disinfectant. After the wound is thoroughly cleansed, the various parts of it may be adjusted, the kind of a suture and the method of suturing depending upon the nature of the wound, always selecting that type of suture which will hold in position best with the least destruction of the tissues. When a wound is sutured, especially if it is

of large size, it is necessary to provide drainage, the kind of which will depend upon the nature of the wound.

In the treatment of granulation wounds of long standing, it is possible in many instances to render them aseptic and bring the wound margins in apposition, and thus induce primary union. In some instances, however, there is so much destroyed tissue that it is impossible to obtain immediate union, even though the wound is thoroughly cleansed. There is no question but that the application of antiseptics as frequently practiced is harmful, and the tissues are frequently injured and wound healing retarded by the application of such agents. Wounds are protected by the inflammatory exudate which continually oozes to the surface, thus favoring granulation, which ultimately results in the filling of the gap, in completing union of the tissues, the time required being much less than if tissues are repeatedly destroyed by the frequent application of antiseptics.

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THE MISSOURI VALLEY VETERINARY ASSOCIATION passed the following resolutions at the Kansas City meeting of the association:

Resolved, That the Missouri Valley Veterinary Association approves House Bill No. 16843, and urges upon Congress its passage at this session.

Resolved, That we request every member of this association to *immediately* correspond with Congressmen and United States Senators urging them to support the Army Veterinary Bill, known as House File No. 16843.

Resolved, That this association urges upon Congress the necessity of establishing supervision by the Bureau of Animal Husbandry over the manufacture and distribution of biologic products intended for interstate traffic and for use upon animals.

Resolved, That we deem the passage of the bill appropriating \$500,000.00 for Texas fever-tick eradication of vast importance to the livestock industry, and we urge its passage.

Doctor, will you take the time to write to *each Congressman from your State, and especially the Representative from your district, and both Senators*, urging them to favorably consider the above measures? A united action by veterinarians will secure the passage of these bills. *Will you help?*

## NECROBACILLOSIS IN SHEEP, OR LIP-AND-LEG ULCERATION.\*

BY H. S. EAKINS, D.V.S., SECRETARY-TREASURER OF THE STATE BOARD OF SHEEP COMMISSIONERS OF WYOMING.

*History.*—Necrobacillosis in sheep is by no means a new disease, but has been known in the British Isles, France, Germany, Hungary, New Zealand and in North America for many years. It has made itself manifest in various forms and in different degrees of severity.

It has been known under several names—as acute-pustular-necrotic and ulcerative stomatitis, necrotic and pustular dermatitis, foot-rot or sore-lip in limbs, necrobacillosis, lip-and-leg ulceration, etc.

*Cause.*—The causative factors applied to this disease are numerous, as errors in diet, low vitality, unhygienic surroundings, frost, rough forage, cactus, various strains of pyogenic organism, amœba parasitica and the bacillus necrophorus. Some of which, no doubt, *are* the predisposing causes for the entrance and the favorable growth of the most probable etiological factor, *the bacillus necrophorus*.

The bacillus necrophorus is an obligate anaerobe, ubiquitous in habitat. It is a slender rod-shaped organism; but pleomorphic, coccoid and filamentous; and involution, club-shaped forms are found, according to the environmental influences, as media, season, age, etc. The filaments are usually beaded, and lie in a mycelial-like mass, but true branching has not been proven.

It can be grown in a nitrogen or residual gas atmosphere in agar or in bouillon. Gas is given off, indol is produced. It is stained by the ordinary carbol-fuchsin and Löffler's methylene-blue stains. In the filaments metachromatic granules are present.

\* Paper given before the Colorado Veterinary Association at Denver, Colorado, January 18, 1912.

There is no doubt but that there must be a break in the continuity of the external tissue before the bacillus necrophorus can gain an entrance for multiplication. Predisposing causative factors and lowered vitality must be taken into consideration. Dr. B. F. Kaupp, pathologist to the Division of Veterinary Medicine, Colorado State Agricultural College, is of the opinion that in lambs first turned into feed lots on rough feed, under which condition sore-lip usually appears in a certain per cent. in about seven to ten days, there is a symbiosis present; *i. e.*, first there must be a lesion, next the aerobic pyogenic organisms gain entrance and produce by the utilization of the oxygen in the wound, an anaerobic condition favorable for the growth of the bacillus necrophorus.

The primary lesions of sore-lip in lambs in the feed lots is due in many instances to the Russian thistles in the feed. In Wyoming cactus, grease-wood, frosts, etc., play an important part in this disease. Lesions occur on the forelegs of bucks from striking, on the heads due to butting, on the sheath and the penis from mounting and having the said parts abraided by cockleburs or sandburs, on the stump of the lambs' tails due to trimming, in the vulva and perineal region in ewes from breeding; also infection takes place through the sebaceous glands situated in the interdigital spaces of the hoof, especially when pierced by cactus. The virulence of the different strains of the bacillus necrophorus found in different localities, together with the condition of the sheep or bucks, is of great importance.

In certain sections of New Mexico and of Colorado the strains of the bacillus necrophorus have a tendency to be less virulent than those of Wyoming. In the former localities the disease tends to clean itself up, so to speak. In Wyoming a very small per cent. can get well without treatment, and radical measures usually must be applied in nearly every outbreak.

*Symptoms and Lesions.*—The usual symptoms are found; *i. e.*, those of necrotic ulcer formation upon the different parts of the body, with dry, hard scabs and some discharging pus of a characteristic odor, sloughing and hemorrhage of the penis, ulcerative vulvitis, inflammation and ulceration of the sheath, forming

the so-called "rosettes"; fistulous tracts, loss of condition, rapid spread and enzootic nature of the disease, etc.

*Treatment and Methods of Control.*—In Wyoming we are using the following methods in the control and in the eradication of necrobacillosis in sheep: The education of the flockmasters to a point where they will understand the nature and the necessary steps to be taken in the treatment of this disease is of primary importance. We are recommending the use of publications issued by the Bureau of Animal Industry and by the experiment stations for this purpose. We are recommending that frequent inspections be made by camp-tenders, who are to be supplied with necessary disinfectants to treat all cases of ulcerations that are brought to their notice by the sheep herders, the sheep herders to watch each day for any signs of this disease, and to report the occurrence of the same to the camp-tender. In some instances range riders are employed by the owners.

In every outbreak the diseased bands of sheep or bucks, also the infected pens or corrals, are placed into strict quarantine as far as possible, and no quarantined sheep can be moved except by a trailing permit granted by a State or Federal inspector.

However, in many instances the exposed sheep or bucks, especially in winter, are running on the range on short feed, and distant from any suitable inclosure, and needs must be moved often; consequently, if the said sheep be kept on too narrow range in close quarantine, the result would be lowered vitality with an increased tendency of the sheep toward the disease.

Mounting chutes are used in the examination of the infected bands of sheep; the diseased are marked with blue chalk and the same are cut out in a cutting chute and placed in quarantine; these are called the "Hospital" band.

Our work now is to treat the exposed sheep, if practical. A trough one foot deep, sixteen feet long and wide enough for one or for two sheep is placed in a chute; at the far end of this trough on the side of the chute is placed securely a bucket or small box containing some of the dip solution as used in the trough. Into the trough is run a five per cent. solution of some recognized cre-

sol or coal-tar creosote dip heated to 110° to 115° F. to the depth of eight or ten inches. The exposed sheep are waded through this dip slowly, and when opposite the small container on the wall an assistant dips each nose to the eyes in the hot dip; another assistant swabs the genitals with the solution. These sheep are trailed while the dip is still wet across the infected trails, if any, to clean range. In one week they are given the same treatment again. The theory of this treatment is to disinfect the parts of the exposed sheep on which the lesions generally occur. The grease of the wool still contains the germs that cause this disease; in an attempt to combat these we give the exposed sheep a general dipping. But here is a problem: The water used in this dip is subjected to a test to determine the exact amount of lye or of sal soda that will counteract the temporary hardness; in most instances it requires one to one and one-half pound of lye, or four to six pounds of sal soda per hundred gallons. The question is, How much lye or sal soda is necessary to dissolve out the grease of the wool in order that the dip may reach the germs, and at the same time be not too severe on the health of the sheep?

After the general dipping of the exposed stuff, they are kept on clean range and subjected to frequent inspections.

The diseased sheep are tabled, the wool around the sheath in bucks is removed by means of sheep shears, the ulcers are curretted and treated with the hot dip, five per cent. solution. The legs are swabbed up to the carpi and to the tarsi with the dip. The ulcers on the genitals are curretted and penciled with silver nitrate; a dilute antiseptic wash is used, as potassium permanganate or the emollient dressing recommended by the Bureau of Animal Industry is applied. Those that show foot lesions only are subjected to hot foot dips, and the same general treatment as for the exposed.

The instruments, also the hands and the clothing of the attendants, are kept as aseptic as possible.

All infected and exposed trails, corrals and ranges are mapped. The work is systematized, so that the work of quarantine, isolation and treatment may be carried out with the least possible loss to the sheep owner.

The quarantined corrals and pens are scraped, the sheds are

thoroughly cleaned from debris, and all are then disinfected. The manure and debris are burned, buried or placed upon some isolated tract that the elements may have their effect.

Shearing-pen inspections with a general dipping for the exposed or infected bands of dry ewes, wethers and bucks after shearing is indicated; but it would mean a loss to dip ewes heavy or with lambs at this time.

*Immunity.*—Through experiments it has been proven that the bacillus necrophorus gives off a very active toxin. Rabbits and sheep that have been injected subcutaneously with the same have died in twelve to sixty hours.

At the present time Dr. B. F. Kaupp and I are co-operating in the manufacture and in the testing out of a vaccine and of a serum prepared from the bacillus necrophorus, with the hope of finding something useful with which to combat the disease.

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DR. JOHN L. GROSS, Manila, P. I., has removed to Denver, Colo. The doctor, who has been stationed at San Fernando, La Union, in the government service, will no doubt welcome the change to the States.

DR. HERBERT F. PALMER has severed his connection with the Abbott Alkaloidal Company and accepted a position with the H. K. Mulford Company, Philadelphia, where he assumes his duties March 1. Dr. Palmer's success in his former position, where he organized the veterinary department, and his many friends among the veterinarians throughout the country, insures his success in his present position.

THE *Ottawa Evening Journal* of February 6 says: "It is learned that Hon. J. G. Rutherford, Chief Dominion Veterinarian, has handed in his resignation to Hon. Martin Burrell and will go to British Columbia. Dr. Rutherford resigned early last summer, but was still in charge when the change of government took place. It was thought that he would reconsider his determination to drop out of the service. Dr. Rutherford, however, has decided to retire to private life, and his resignation, it is said, is now in the hands of the minister of agriculture. Dr. Rutherford has been a valuable servant to Canada, and his retirement will be generally regretted."

## REPORTS OF CASES.

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### A CASE OF HYPOSPADIAS IN A RAM.\*

By RAYMOND PEARL, Ph. D., Biologist of the Maine Agricultural Experiment Station, Orono, Me.

Some months ago there came into my possession, through the kindness of Professor T. R. Arkell, of the New Hampshire Agricultural Experiment Station, a lamb which possessed such abnormalities of the external genitals as to suggest that it might possibly be a case of hermaphroditism. In sending the animal Professor Arkell wrote (October 14, 1911) as follows regarding its history: "We have in our station flock here an hermaphrodite lamb about three and a half months old. He possesses a scrotum, or rather a double scrotum, and two small testes. He has an excrescence in his belly where normally the sheath is, but there is virtually no opening therein. He has an opening behind resembling a normal vulva, through which he urinates."

When received the animal was submitted to a careful external examination. It was rather small in size, but otherwise presented no peculiarity in general external appearances. This is evident from Fig. 1. No peculiarity of any kind relative to secondary sexual characters was to be observed, other than in respect to the external genitals, which were obviously malformed.

The condition of the external genitals was as follows: The *scrotum* was of normal size, but cleft in the middle line clear to the body wall, so that separate right and left scrotal sacs were formed. These sacs were covered with short wool, except where they joined each other in the middle line. Here there was a strip of skin about 1 cm. wide, which was soft, devoid of wool, and pinkish in color. From its cranial end, which was at the cranial end of the cleft separating the scrotal sacs, this strip of moist, bare epidermal tissue extended caudad and dorsad until it reached the anus. As it approached the anus it widened in extent. In the

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\* Papers from the Biological Laboratory of the Maine Agricultural Experiment Station, No. 34.

normal position of the scrotal sacs and the legs this tissue was thrown into a deep longitudinal fold, somewhat simulating in superficial appearance a vulva. The appearance of the structure described may be seen in Fig. 2.

In the scrotal sacs testes could be felt. At the time of the first examination (October 27, 1911) these organs were distinctly

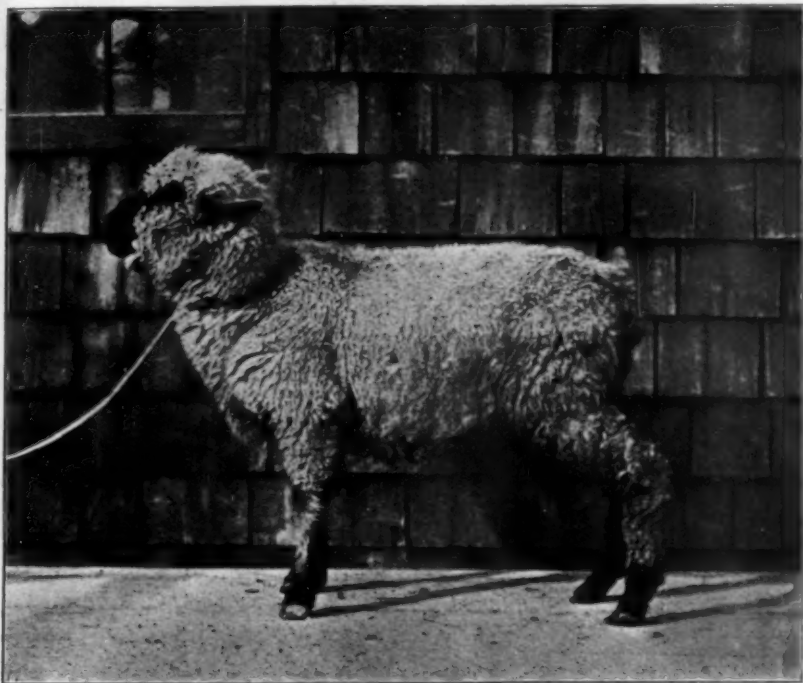


Fig. 1. Showing general appearance of lamb discussed in text.

smaller than at the time of autopsy (January 13, 1912). The sheath could be felt as described by Professor Arkell.

The animal was killed and dissected January 13, 1912. A typical case of hypospadias was the condition found. The testes were of normal size and appearance. The penis was small but normal, except in regard to the urethra. From the neck of the bladder (which was normal) the urethra ran caudad as a closed tube to a point just below the anus. There it ceased as a tube, and as an open fold of membrane became confluent with the skin on either side, forming the pinkish moist strip of tissue already described from the external examination. The urine was discharged

through the small opening where the tubular portion of the urethra ended just below the anus. This opening was so close to the anus, and the cleft formed by the opened-out urethral wall was so deep, as to give the appearance in external examination described by Professor Arkell, that the urine came from a vulva-like organ.



Fig. 2. Showing the appearance of external genitals in lamb. The two parts of the divided scrotum are held apart, showing the deep cleft between. A, anus. B, level where tubular urethra opened to outside. The strip of opened urethral tissue shows here. C, right scrotal sac. D, left scrotal sac.

The right and left vasa deferentia, after leaving the testes, passed up through the inguinal canals in the normal manner. Their course to the dorsal wall of the bladder was perfectly normal. There these tubes came to lie close beside one another, and the pair extended caudad to a point just caudad of where the urethra left the bladder. There they ended blindly. There were no openings of the vasa deferentia to the urethra: Both vasa deferentia were considerably enlarged (to an average diameter of about 4 mm.) throughout the last 4 or 5 cm. of their course. The cause of this was an engorgement with material, which consisted apparently of hardened secretion from the accessory glands. The enlargement was greatest at the blind ending of the ducts, and tapered off gradually in the cranial direction.

No other abnormalities beyond those here described were found in any part of the body.

The case was clearly one of typical *hypospadias perinealis*.

### DISLOCATION OF THE FEMUR.\*

By B. F. KAUPP, Pathologist, Div. Vet. Med. Colo. State Agr. College, Fort Collins, Colo.

In the pathology museum of this college the author has assembled two interesting cases, which, according to the leading surgeons, would come under this head.

Moller states that dislocation of the femur is always accompanied by rupture of the ligamentum teres.

Firdler reports one case in a foal in which the epiphysis was separated from balance of femur.



FIGURE 1.

As causes are given violent movement of the limb on the hip joint, excessive flexion or extension in falling. Excessive lateral movement, either adduction or abduction.

As symptoms are given the limb may be lengthened or shortened, depending on the direction the articular head takes. Its

\* From the Laboratory of Pathology, Division of Veterinary Medicine, Colorado Agricultural College.

movement in certain ways may be limited, while in others it may be increased. Freedom of movement is always lost.

Prognosis is always unfavorable.

Figure No. 1 represents a case in a foal about two months old, who became frightened by a passing object and ran up a steep embankment and fell. *A* is the end of the sectioned femur. *B* is the ischial tuberosity. *C* is the sectioned end of the ilium. *D* represents the articular head of the femur separated at *E* from the neck. *F* represents the cotyloid cavity, in which the articular head normally rested. *G* represents a new facet, at which point a new articular surface was being formed.



FIGURE 2.

The case was of six weeks' standing when the colt was destroyed. The head of the femur was displaced upward and forward. The leg was considerably shortened.

In this case the ligamentum teres was ruptured.

Figure No. 2 was a case of a bay mare eight years old. All the history that could be secured was that she had been kicked a year previous. The leg was considerably shortened. No weight could be placed on the leg.

*A* represents the articular head of the femur. *B*, the normal articular cavity. *C*, the newly formed cavity in which the head now played. At the lower border of the articular head can be seen some exostosis, as well as in the newly formed cavity. *D* represents the sectioned end of the femur. *E*, the ischial tuberosity. *F*, the sectioned end of the ilium. The displacement was upwards and a trifle backwards. There was a rupture of ligamentum teres and a partial rupture of the pubeo-femoral ligaments.

### A POLY-CELLULAR CYST.

By J. E. AGHION, V.S., Veterinarian State Domains, Sakha, Egypt.

The photograph which I here produce illustrates a case of a poly-cellular cyst, which, for reason of its rarity, may be of some interest to the readers of the REVIEW.

A brown mule, nearly 17 years old, had a big growth situated low down on the left side of the abdomen, and is about the size



of a man's first, soft to the touch when first examined (two years previous to the operation), but now hard, somewhat round in shape and movable. It has been growing for nearly eight years to attain its present size, without materially interfering with the animal's general health or its usefulness.

An operation, with removal of the tumor, was suggested and performed on November 22, 1911. The animal was cast and the seat of operation properly disinfected; a trocar and canula were first introduced into the tumor to ascertain its nature; a jelly-like fluid escaped through the canula, indicating that one has to deal with a cyst of some sort.

An incision was then made and the operation carried through; the skin and connective tissues were carefully dissected, the tumor seized and finally removed with the ecraseur. No hemorrhage followed. The cyst weighed 830 grammes; the clinical and microscopical characters go to show that it is a poly-cellular cyst.

The wound was daily dressed with creolin solution and dusted with iodoform; during the treatment the animal suffered from an enormous cedema of the abdomen, but got over it five days afterwards. The wound healed up nicely and the animal made a good recovery, and now in regular work (December 23, 1911).

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SPECIAL PATHOLOGY AND THERAPEUTICS OF THE DOMESTICATED ANIMALS, by Hutyra and Marek. Third revised and augmented edition. Published by Gustav Fischer, Jena, Germany.

After an elapse of only a little more than two years a new edition of this classical work of two volumes became a necessity. It speaks well for its popularity among German readers. Our English literature has no equal to this excellent work.

The new edition was greatly improved and augmented. Quite a few instructive pictures, also a number of artistically produced colored plates were added. Special attention has been paid to the sero-diagnostic methods and the diseases caused by blood parasites, and also to preventive vaccinations.

This classical work cannot be recommended too highly, and the wish for a translation into the English language in the near future certainly appears justifiable.

DR. WILFRED LELLMANN,  
Professor of Veterinary Pathology.

## ABSTRACTS FROM EXCHANGES.

### ENGLISH REVIEW.

By Prof. A. LAUTARD, M.D., V.M.

TWO CASES OF NECRO-BACILLOSUS [*W. Walker, M.R.C.V.S.*].—Although no bacteriologic examination was made, these two cases were considered by the author as due to Löffler's bacillus:

*First Case*—Dog quite lame on near fore leg. The whole foot is intensely inflamed and swollen, up to the carpus. Between the digits the skin is red, thickened and hairless, with pinhead areas of serum-like fluid. The pad enlarged, twice its normal size. In the course of a few days shows pustules, from which exuded dark colored bloody pus. Little fistulas resulted, and a probe could be introduced in them, three-quarters of an inch between the skin and bones. Some necrotic tissue escaped with the discharge. The dog still kept in good health. Treatment: Clean bedding, liberal diet, fistulas split up, abscesses opened and antiseptic dressings. Quinine and iron were given internally. Recovery in five weeks.

*Second Case*—Two-year-old male cat. Large necrotic area on the face, skin hard and parchment-like, much under-run in the centre, but firmly adherent to healthy tissue round. Several pinhead-like holes give out dark thin pus. Treatment: Incision of diseased skin and usual treatment of present wound. Recovery rapid.—(*Veter. Record.*)

MELANOSIS IN THE HORSE [*F. Chambers, M.R.C.V.S.*].—Illustrated record of the case of a 13-year-old grey mare, in fair condition, whose body was covered with numerous deposits of melanin, principally in the parotid region of the off side. The presternal, precrural, popliteal and other glands were also diseased. This condition had been growing slowly since six years. Special bridle had to be made for the mare on account of the

enlargements at the bone of the ear; with it the animal could be used without any trouble.—(*Vet. Journ.*)

**BRAIN CASE** [*Capt. A. J. Williams, A.V.C.*].—Fourteen-year-old cob showed staggering gait. She leans on the off side, rests against the stall partition, has discharge from both nostrils, pupil normal, nervous expression. Marked incoordination of movements and ataxic gait. Near foreleg throws out spasmodically in walking, foot put to the ground as if uncertain of the distance. Paraplegia appears the next day. Treatment: Purgative, laxatives and potass. iodid. Case diagnosed as cerebral hemorrhage was followed by recovery after a few days.—(*Ibid.*)

**IMPACTION OF THE COLON DUE TO ABDOMINAL ABSCESS WITH RUPTURE AND DEATH** [*C. W. Townsend, F.R.C.V.S.*].—A three-year-old shire gelding showed symptoms of colic, which are attributed to impaction of the colon, verified by rectal examination. Usual treatment was followed by good results. Three days after the colt is taken sick again with more severe symptoms and, notwithstanding all care, died on the fifth day from the first attack. *Postmortem*: In cutting into the scrotal region a quantity of yellow inspissated pus was discovered. In the abdomen there was also more or less pus mingled with the abdominal contents. At the entrance of the internal abdominal ring on the near side were found the remains of a big abscess cavity with darkened walls, in which there remained some foul smelling pus.—(*Vet. Journ.*)

**CLINICAL CASES** [*Prof. J. J. O'Connor, M.R.C.V.S.*].—*Sternal fistula in a horse.* A sinus of long standing, running on the cariniform cartilage of the sternum. Properly treated recovers.

*Sinus in lower jaw.* This existed in the right horizontal ramus of the lower jaw and had resisted all treatment. The sinus was freely opened, curetted down to the bone and treated with antiseptics, principally iodine. Recovery in two months.

*Tracheocele in a horse.* Aged hunter has carried tracheotomy tube for past twelve months. The original tube had become damaged and while another was to be fitted, a large cartilaginous granulation formed inside the trachea and encroaching on the tracheal opening. Under the influence of cocaine, the horse

was relieved of this by excision in slices with a sage knife and finally a new tube was inserted, enabling the horse to continue his work as a hunter.

*Urethral calculi in a dog.* Old collie in poor condition, has distressed appearance, passes urine in drops frequently, shows pain on pressure over the prepubic region and a catheter introduced is arrested just behind the os penis. Morphine is injected. Penis is exposed, the urethra opened just behind the os and six small spherical calculi are removed. Although the dog recovered from the narcotic, he died 24 hours after. Postmortem showed the bladder highly inflamed.

*Needle and thread in rectum of a pug.* While playing he was seen swallowing both the needle and thread. He has anxious expression, screams now and then with pain, passes blood by the anus. Rectal digital examination detects the needle some distance from the anus. In dilating the anus and rectum with the equine urethral dilator and throwing reflexed light in the rectum with mirror, the point of the needle was grasped with forceps and drawn out with the thread.—(*Vet. Journal.*)

**VOMITING IN THE HORSE** [*Hamilton Kirk, Student Class D.*].—Called to attend a seven-year-old horse, the writer proceeded to examine his patient, which manifested colicky pains. The rectum was full of hard dry feces, which he removed, and the bladder found distended with large quantity of urine. Catheter was introduced and eserine injected after soap warm clyster had been tried. The next morning the patient was no better, passed no feces and received a pint of linseed oil. Towards evening he vomited and kept it up all night. Fatal prognosis was announced, as rupture of the stomach was diagnosed. Death occurred a few hours after. Postmortem showed stomach and intestines distended, stomach and oesophagus intact, big rent in the cœcum and the third portion of the large colon.—(*Vet. Record.*)

**MOTOR CARS AND DOGS** [*Mr. F. J. Taylor.*].—At a meeting of one of the English Veterinary Societies the author related a series of cases of accidents to dogs from motor cars which were interesting.

A wolf hound was run over by both near side wheels of a car. No external injuries were inflicted. When seen he was in a totally paralyzed condition and remained in that condition

five days, being artificially fed. Catheters, enemas, counter irritations and iodide of potassium cured him after six days.

An Irish terrier jumped from a car in motion and was run over. He was in great pain, difficult to handle. No external injury to help the diagnosis. Died during the night. He had rupture of the spleen and the liver was split in seven pieces and the duodenum almost completely severed.

A collie dog had both testicles torn away, no complications. Rapid recovery.

Dalmatian bitch run over by one wheel shows no signs of definite nature for 12 hours. Then she is distressed, breathes hard. Passes no urine. Great pain in the perineal region. Died in 24 hours. She had ruptured bladder and peritonitis.

A fox terrier bitch, after a street accident, is seen in a collapsed condition and evident signs of internal hemorrhage. Abdomen is open, and rupture of the right kidney is found. It is ligated and removed. Complete recovery in a few days.

Retriever dog after an accident with a motor cycle has prolapsus of the bowels and rectum and external wound of the thigh and inguinal region. Protopexia is performed with good result.

Young terrier injured in the lumbar region and kidney dies in an hour with rupture of the kidney and fracture of the spine.

Cross-bred collie bitch had both fore-legs fractured. Recovery followed setting.

Terrier dog is injured in the neck. Dies in comatose condition after 24 hours. Had dislocation of the occipito-atloid articulation, spinal cord severed.

A dog is injured and has the gastrocnemius tendon completely divided on the near hind leg. Suture of the tendon, plaster-of-paris dressing. Complete recovery.

In another case of partial or complete rupture of the stomach, laparotomy was performed and a necrosed, partially ruptured portion of the stomach wall was excised. The patient is yet alive.

Stricture of the bowels was caused in a spaniel bitch. She had complete stoppage and intestinal paralysis. Glycerine suppositories, enemas, the use of long bone spoon failed. Laparotomy performed and the constricted portion removed. Murphy button was applied and required a second operation for its removal and replaced by another which was passed afterwards in a partially digested condition.—(*Veter. News.*)

## FRENCH REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

URINARY POUCH IN A YEARLING BULL [*Profs. Ch. Besnoit and V. Robin.*].—This animal which presented the symptoms related in *European Chronicle* was in such condition that all interference with prospects of permanent relief was not possible; the possible complications and the condition of the animal spoke against it. The bull was destroyed. The postmortem examination was principally directed towards the urinary apparatus.

The kidneys showed accused lesions of inflammation and degeneration. The ureters were healthy. The bladder was of normal size, the mucous membrane congested and showed here and there little papilliform neoformations. The membranous urethral was normal. The dilatation, ovoid in form and as big as a child's head, is developed on the bulb. The bulbo-cavernous muscle is stretched and thinned out. The spongy portion of the penian urethra is united with the sub-mucous connective tissue. The mucous membrane which lines the pouch is greatly inflamed, ecchymotic and has a tendency to gangrenous giving away. There are extensive lesions of acute urethritis.—(*Revue Veterin.*)

PERFORATION OF THE INTESTINE BY HERBACEOUS STEM—FATAL PERITONITIS IN A HORSE [*M. Letard*].—Heavy draught stallion, 12 years old, had slight colic and loss of appetite. Placed on observation, nothing develops, and he is returned to work. Soon however the abdominal pains reappeared. They are more severe and intermittent. Counter-irritating frictions are prescribed; with opiates, drenches and a subcutaneous injection of arecoline. The next day the temperature rises, the features are contracted, pulse thready, rectal examinal is negative. The symptoms become more serious and after four days death takes place. At the postmortem were found: About fifteen litres of fluid characteristic of purulent peritonitis. Thick false membranes surround the cross of the cæcum and in their middle a large purulent collection, in the bottom of which is detected a foreign body which has made its way through the intestine. It is a stem of some herbaceous plant, very hard and stiff, with sharp point, which has pierced its way through the intestine.—(*Bullet. Soc. Cent.*)

CURIOUS CASE OF CRYPTORCHIDY [*By the same*].—This records a very rare, if not the only case of a horse which had four testicles. A case of quadriorchidy.

The horse was seven years old when he was bought. A few weeks after he became nervous and ticklish, reared when other horses came near him and finally was sold to the writer. Examined, the inguinal region is in normal condition, without cicatrix, nor the presence of any organ in the canal. The animal is secured, the region disinfected and by an incision the inguinal canal is exposed, the hand is pushed through it and a small body attached to a thick cord is pulled out and removed with clamps. Similar operation is performed on the other side. Recovery followed in the ordinary length of time and the horse returned to work. But as time went by and the general condition of the animal improved, his bad disposition came back, and soon he became dangerous to approach. Thinking that perhaps by some peculiar anatomical anomaly the horse had not been properly castrated, he was again secured and another operation performed by entering the abdominal cavity. At the superior inguinal canal a testicle was found and removed with the ecraseur. Similar steps were followed for the other side. The recovery was again without any event, except that the horse lost his energy and became very lazy. Cases of triorchidy have already been reported. Of quadriorchidy this is the first.—(*Bullet. Soc. Cent.*)

UREMIA BY ANOMALY OF THE URINARY APPARATUS IN A FILLY [*Mr. Bonnigat*].—Percheron filly after an easy birth is found the second day dull, without appetite and always lying down. The body is a little swollen. Reported as not having urinated, a catheter is introduced and when withdrawn is moist with urine at the end. Persistency of the uracus is suspected and the swelling of the body attributed to stomachic indigestion. The animal died comatose the third day. At the autopsy the peritoneal cavity was found distended with clear, yellowish fluid, a little albuminous and with strong odor of urine. The absence of bladder was then detected. The uracus from the place of insertion of the ureters, near the umbilic, is open in its whole length in its superior border, forming a regular grooved gutter. The liver was swollen and congested.—(*Rev. Pathol. Comp.*)

METALLOID FERMENTS IN ACUTE DISEASES OF HORSES [*Mr. A. Plant*].—After a concise consideration of the preparation of

colloidal and of their properties and indications, the writer gives the history of three cases treated by the subcutaneous injections of silver metallic ferments with which he obtained very quick recovery. The cases were one of pasteurellose, with an elevation of temperature at 40 C., which, after two injections of 10 c.c., was in full convalescence and recovered in seven days. Another case of pasteurellose again with a temperature of 41 was convalescent in 4 days. A third case of pneumonia which was treated with injections of 10 and 20 c.c. and recovered in a few days. The author recommends the treatment from the start of the acute disease, in intravenous injection of 10, 20 and 50 c.c., according to size of the animal. The intra-muscular injections give the same results.—(*Rec. de Med. Vet.*)

RHEUMATOID LAMENESS WITH SYNOVIAL AND TENDINOUS LOCALIZATION [*Mr. Floriot, Army Veterin.*].—Aged seven years, this thoroughbred had pneumonia, was treated and recovered. Two weeks later he had meta-pneumonic synovitis of the left posterior sesamoid sheath, which is relieved by salicylate of soda. Two months later another synovitis on the right posterior sesamoid lays him up. Two months after he is lame on the left fore-leg with synovitis of the fetlock. Several months after it is the right fore-leg which breaks him down. Then comes other series of synovitis on the left hind leg, then the right fore, the right hind, the left fore and finally the left fore fetlock. To resume, this horse has for two years following an attack of pneumonia been the subject of numerous rheumatismal lamenesses which localized themselves on the tendinous structure of the four extremities. This sudden apparition, after a slight work or even when at rest, their rapid and complete disappearance, with or without treatment, pleaded much in favor of a rheumatismal origin.—(*Rec. de Med. Vet.*)

## BELGIAN REVIEW.

By Prof. A. LIAUTARD, M.D., V.M.

ENORMOUS OVARIAN CYST IN A GOAT [*Profs. Hebrant and Antoine*].—This animal has had lately an abdomen much enlarged; she has lost some flesh, yet has good appetite and seems free from any disease. The abdomen quite large, has the shape

of an ascitic belly, flanks are hollowed, and fluctuation is readily made out. The temperature is normal and all functions performed regularly. Peritoneal dropsy is diagnosed and a puncture made gives escape to a large pailful of clear fluid slightly tinged with blood. The animal dies two days after. At the postmortem all the organs are found normal. General anemia is well marked. There is no fluid in the peritoneum. The uterus is small, retracted and has on its right horn an enormous ovarian cyst as big as two men's heads. The albugineous coat is thick and very vascular. It contains blood with numerous clots. It filled a great part of the abdominal cavity. At the time of puncturing done two days before, the trocar in penetrating into the cyst had injured one of the large veins and given rise, in the emptied cyst, to a fatal hemorrhage.—(*Annales de Belg.*)

TRANSVERSAL ANTERIOR HEMI-FOETUS [*Prof. Dr. Gratia and Adjunct Antoine*].—The record of the foetus of a calf which had been dropped, while the cow was at pasture. Judging by the appearance of the coat and of the claws it had arrived at the end of gestation. It measured forty-seven centimeters in height and as a whole represented half of a foetus composed only of the anterior portion of the body, well formed and supported by the two fore-legs. The remains, back of this, were missing. The trunk ending a little back of the umbilicus by a blunt extremity, like a rounded thick stump, covered with hairs and without marks of opening or cicatrix. The only anomaly to be noticed was that there was a slight superior prognathismus. The thoracic organs were normal. In the abdomen, the digestive canal ended in a blunt extremity representing the rectum, dilated with meconium. No kidneys or ureters could be found, otherwise the other organs were about normal. The skeleton of the thorax was incomplete, having but eight dorsal vertebrae and nine pairs of ribs, seven of which had cartilage which rested directly on a normal sternum. The vertebral column ended at the eighth dorsal vertebrae, the last four of which were imperfectly developed. The spinal cord ended by an enlargement towards the last dorsal vertebrae but one.—(*Annales de Belg.*)

PARALYSIS OF THE SOFT PALATE IN A DOG [*Profs. Hezrant and Adjunct Antoine*].—Draught dog is a strong mastiff of three years, well made and able to do serious work, but as soon as he

is put to a slight pulling, and his breathing is accelerated, he begins to roar quite loudly and has to stop. Examined while at rest, nothing is observed. Made to move, he begins to roar. The noise is only heard when he breathes through the mouth. If this is kept closed, and the animal breathes through the nose only, no roaring is heard. There is no inflammatory condition of the mouth, but the soft palate is very long, flabby, and covers partly the opening of the glottis. The diagnosis is made of paralysis of the elevator muscles of the soft palate. Counter-irritations to the throat and nerve stimulants are prescribed, but it is doubtful if the dog will ever be able to perform the work expected of him.—(*Ibid.*)

PHARYNGEAL PAPILLOMAS IN A DOG [*By the same*].—Street mongrel, 10 years old, has lost his appetite. His general condition is good, but he has become aggressive and ill-tempered; he also has difficulties in swallowing his food. His temperature is normal, and pulse and respiration natural. All great functions normal. The examination of the mouth reveals the presence of two tumors, papillomatous in aspect; one as big as a hazel-nut and the other as a large pea. They could not be extracted with nippers and curved scissors, but a human amygdalotomy forceps being obtained, the amputation was readily performed. An abundant hemorrhage followed and a syncope sufficiently serious to require artificial breathing and inhalations of ether and chloroform. Tincture of iodine was applied for four days after, and the animal returned cured to the owner.—(*Ibid.*)

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#### GERMAN REVIEW.

By JOHN P. O'LEARY, V.M.D.

INTESTINAL CAPSULES AND THEIR CLINICAL USE [*Vet. Richard Wilke, of Guben*].—In his experiments, Wilke used gelodurat capsules (gelatine capsules hardened with alcoholic or ethereal solutions of a known formaldehyde quantity); he also employed in his experiments the intestinal capsules prepared by the firm of Bengen & Co., Hannover, which are composed of good French gelatine and hardened with formaldehyde, keratin or alum. The result of his diligent work is as follows:

First.—The capsules for the small intestine remain in the stomach of the horse and dog in most cases for about an hour, when the stomach is empty or moderately full.

Second.—The average time required to dissolve the capsules in the intestinal tract is as follows: Formaldehyde capsules, about three hours; gelodurat capsules, about three hours; keratin capsules, about one hour, and for the alum capsules, about three hours, in the empty stomach.

Third.—The keratin and alum capsules are more easily dissolved in the stomach; consequently they are not suitable for intestinal medication.

Fourth.—The capsules to be recommended for the administration of intestinal remedies are the formaldehyde capsules for the horse and the gelodurat for the dog.

Fifth.—The capsules must be given on an empty stomach, if possible.

Sixth.—The formaldehyde and gelodurat capsules, when filled with bismuth, are better adapted for diagnostic purposes in Roëntgen examinations of the anterior portions of the intestines.

Seventh.—The tapeworm capsules of Bengen & Co. have proved to be, in spite of their being readily soluble in the stomach, a superior, reliable and relatively non-poisonous remedy in the therapy of intestinal parasites, especially the tænia of the dog, and in particular when given on an empty stomach.—(*Deutsche Tierärztliche Wochenschrift*, No. 4, January, 1912.)

CONTRIBUTION TO THE MECHANICAL TREATMENT OF TORSION OF THE COLON IN A HORSE [*Dr. Hafner, of Waldkirch*].—Hafner describes a case in which he treated a horse suffering from torsion of the colon, according to the procedure of Steinbrück. After casting the horse and placing the animal in the dorsal position, with the hind feet held in position about  $\frac{3}{4}$  of a m. from the ground. By manual massage a cure was effected.—(*Mitteilungen des Vereins Badischer Tierärzte*, 1910, No. 5.)

PETECHIAL FEVER (MORBUS MACULOSA) IN THE HORSE [*Joseph Tantas*].—Tantas observed twenty cases of petechial fever, ten of which were fatal. He also noted that it occurred as a secondary disease, and in the majority of cases occurred during cold weather. He saw petechial fever following phlegmonous inflammations of the neck, after strangles of the metastatic form, and further after intestinal catarrh, accompanied with fever. Tantas maintains that petechial fever is an auto-intoxication dis-

ease. From cases under observation, Tantas assumes that the repeated administration of iodipin subcutaneously (the injection to be given at body temperature) adds to the animal economy a substance which at times increases the opsonic power of the blood and which also enables the body to protect itself against the toxins of petechial fever.—(*Oesterr. Monatsschrift für Tierheilkunde*, 1910, Page 65.)

THE TREATMENT OF TETANUS IN THE HORSE WITH 3% SOLUTION OF CARBOLIC ACID [*Cantone*].—Cantone treated horses and mules which were suffering from traumatic tetanus, according to the procedure of Baccelli, with subcutaneous injections of 3% carbolic acid water, and obtained very satisfactory results. In one particular case, that of a mule, the tetanic infection followed an abrasion of the skin from the saddle. The animal suffered intensely, and the case was considered incurable. Cantone gave the animal, on the first day, three doses of 100 grammes each 3% carbolic acid solution, on the following day 135 grammes, on the three succeeding days 170 grammes, and then going back to 100 grammes. In 14 days he gave 90 grammes of carbolic acid, the maximum amount in one day being 8 grammes. By this method of treating tetanus, Cantone, in 14 years of active practice, has treated many cases successfully.—(*Deutsche Tierärztliche Wochenschrift*, No. 51, 1911.)

CONTRIBUTION TO THE STUDY OF TUBERCULOSIS IN SEAFISH [*L. V. Betegh, of Fiume*].—The discovery by Dubard-Baillon-Terre of fish tubercle bacilli in fresh-water fish, which is similar in many respects to the tubercle virus of warm-blooded animals. Numerous experiments have proven that the tubercle bacilli of the warm-blooded animals produces in fish no typical tuberculosis lesions. Betegh reports in his work on experimental investigations which he carried out upon seafish, partly through intraperitoneal, partly through intramuscular, injections of pure emulsion cultures of fish tubercle bacilli. The results were that the marine fish were less susceptible to infection from fresh-water-fish tuberculosis by artificial inoculation in doses of 0.1 to 0.2 c.cm. pure cultures. Of the six experiment animals two survived. In one fish local tuberculosis developed deep in the muscle of the seat of inoculation. In the other case acute lesions developed in the swimming bladder. The tubercle bacilli of the affected animals showed distinct degenerative changes and would

not grow on artificial media. The investigator is of the opinion that this degeneration is attributable to the biochemic properties of the organism and the iodine elements present in the seafish.— (*Berliner Tierärztliche Wochenschrift*, No. 3, 1911.)

CLINICAL REPORTS.—*Schmitt, of Auerbach*, treated an ox suffering from a severe form of urinary infiltration. Embrocations and warm poultices were applied, which had the effect of removing the necrotic tissues from the prepuce and adjacent parts, numerous incisions being made to drain the tissues of pus. After three months' treatment the animal made complete recovery.

*Haag, of Wörth*, reports five cases of prolapsus of the rectum in pregnant swine. In each case the bladder was emptied by means of a catheter; then reposition of the rectum was possible when the hind-legs were raised from the ground. Through the use of the rectal pessaries of Uebele the intestine remained in position. The animals recovered quickly, and remained healthy.

The same author saw two cows suffering from oesophageal paralysis. For eight days the animals could neither eat nor drink. Hot applications were applied to the neck and stimulating embrocations rubbed in over the affected parts. Recovery followed in about two weeks. The cause of the paralysis was thought to be due to feeding the cows on decayed potatoes and turnips.

For the treatment of otorrhœa in the horse, good results were obtained by washing out the ear with a solution of boracic acid and then dusting the parts with tannoform.

Three horses in one stable were affected with asthma after being fed for some time on mouldy clover hay. Change of feed and internal medication with liquor potassi arsenitis effected a cure in a few weeks.

Mattern treated a horse which had been affected with a nervous disease. The animal was continually excited, irritable and shaking his head, sodium bromide being prescribed in this case.

The same remedy had been effective in the treatment of convulsions in sucking pigs.

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Mattern describes a case in which lactation set in without the animal being pregnant. From exterior appearance a cow showed all symptoms of being heavily in calf. Six weeks before the probable date of calving she became dry. One day she suddenly began to give an abundant supply of milk (18 litres per day), without giving birth to a calf.—(*Münchener Tierärztliche Wochenschrift*, 1910, Nos. 6, 7, 8, 9.)

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MR. WALTER DURBROW, of the firm of Atkins & Durbrow, old advertisers in the REVIEW, announces the death of his business associate of 30 years, Mr. William C. Atkins, and begs to state that the business will continue under the same name.

THE ANNUAL MEETING OF THE PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION will be held in the amphitheatre of the School of Veterinary Medicine, Thirty-ninth street and Woodland avenue, Philadelphia, March 5 and 6. A full and interesting programme will be presented, and *all* veterinarians are welcome.

PROCEEDINGS OF CHICAGO MEETING, U. S. LIVESTOCK SANITARY ASSOCIATION, December, 1911, now ready for distribution. These proceedings are very valuable to both veterinarians and stockmen. Until the issue is exhausted a copy may be had for \$1.00. Send for yours *now*. Address Prof. J. J. Ferguson, secretary, Union Stock Yards, Chicago, Ill.

THE MAINE VETERINARY MEDICAL ASSOCIATION held a very successful meeting at Portland on January 10. President G. F. Wescott, in his address to the association, gave some sound advice and gave much encouragement and inspiration to his fellow-members. The report of the meeting reached us too late for publication this month and is held for the April number.

IN THIS NUMBER we are publishing a summary of the proceedings of the Wisconsin Society of Veterinary Graduates, which Secretary West assures us was the largest ever held, enthusiasm and harmonious co-operation being marked features. He also states that the society is in the healthiest condition that it has enjoyed since its inception. Hurrah for Wisconsin!

## ARMY VETERINARY DEPARTMENT.

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### FORTY-NINE YEARS OF STRUGGLE FOR A VETERINARY CORPS, U. S. ARMY.

In the last issue of the *AMERICAN VETERINARY REVIEW* Dr. D. Arthur Hughes, the ever-optimistic, enthusiastic and indefatigable worker in the cause of veterinary progress, acclaims in his characteristic manner: "Wouldn't it be fine if, before the coming of the fiftieth anniversary of the American Veterinary Medical Association, in 1913, we find that we have founded in the army a veterinary corps, which has within itself the means for its own development and for a lasting good to the profession?"

It would be fine. The year 1911 has given to us a matriculation standard for our colleges that marks another turning point in veterinary education, and it has given to us a uniform veterinary degree which will unify our profession in the eyes of the laity! Two steps that will be recorded in the history of the American veterinary profession in big letters as indicating a new period of advancement and unification.

Of the few signs of veterinary times past left to us none is worse than the impotency and backwardness of the present army veterinary service; not only is its condition humiliating, if we compare it with the properly arranged veterinary organizations of European and Asiatic armies, but it alone has remained out of proportion with the rise and growth of other branches of our American veterinary profession. There has been no lack of attempt to lift the army veterinary service out of this deplorable condition by almost continual appeals to Congress for more than 25 years past. None among us have struggled longer and harder for recognition than have the army veterinarians and their friends. Heroic efforts in this line are chronicled, and lives have been sacrificed to gain result, but so far our strength has not been commensurate with the strength of our opponents.

Five months before the birth of the old United States Veterinary Medical Association, forty-nine years ago, on March 3, 1863, Congress first recognized the American veterinary profession by providing that "Each regiment of cavalry shall have one

veterinary surgeon, with the rank of sergeant-major, whose compensation shall be seventy-five dollars per month." While the rank thus established was below that of an officer, the pay of seventy-five dollars was the pay of a lieutenant of the army, showing that the Congressmen of 1863 recognized this position as professional. Notwithstanding all the valiant fights made ever since for the establishment of an army veterinary corps, the army veterinarian of 1912 occupies practically the same position of his predecessor of 1863. A force that successfully withstood attacks from our ranks for forty-nine years is not a weak force. It will be well to realize this fact.

Yet, however this may be, let us not only hope and wish for a success, but to gain this in reality we must *unite* in efforts to wipe out the last vestige of feebleness remaining from the days of our infancy of 1863. We are stronger now, quite strong, indeed, if we intend to be so. If we will, we can achieve success in 1912, and thus add another laurel to the wreath of progress just before the fiftieth anniversary of a national gathering that shall mark the birth of a new profession in a young nation full of might and accomplishment. Let us stand by our Army Bill H. 16843.

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### THE ARMY HORSE AND THE HUMANE SOCIETIES.

The Maneuver Division, mobilized at San Antonio, Texas, in March, 1911, and continuing until November, 1911, brought together 12,000 soldiers and 6,000 horses in open camp. The men had shelter, being provided with tents; the horses had none, because it is the old fashion in our army, inherited from the days of the Indian campaigns in uncivilized territory, to confine the animals to picket lines, to have them on hand for feeding, grooming and saddling.

Open-air life in the balmy days and nights of summer is healthful to horses; it is healthful to men, as one can experience by an occasional night-rest in bivouac, with nothing but a blanket for a cover. But all days of the year are not summer days. The months of March and April, 1911, were exceptional as to meteorological disturbances in Texas. There were cold storms from the north, lasting for days at a time, producing discomfort to the men in the tents and intense suffering among the horses on the picket lines. Shivering horses could be seen everywhere; many were coughing, and some developed cases of pneumonia.

No man with a human heart and with a knowledge of the economical care of animals could have looked on to this unnecessary exposure of animals without feeling and knowing that this condition could and should be remedied. Consequently, the army veterinarians went forward with suggestions to the officers of the department having such matters in charge, to provide for field stables in the form of sheds of wood or canvas. But official prejudice and authoritative stubbornness produced an argument like this: "What, field stables for horses? Who ever heard of such a thing! What next will you veterinarians ask for? There is no money available for such purpose. Besides, shelter is not necessary for horses in camp; they must get hardened to this thing. Nature has provided them with a coat of hair for protection against cold and rain. Look at the range horse; he does not suffer from want of shelter, and is the healthiest horse in the world."

Not yet discouraged, the veterinarians argued back: Range horses are horses living in freedom. They are keen to locate natural shelter, in the woods, among brushes and on protected sides of hills and mountains. If they do not find such shelter, they succumb, as thousands of skeletons on the Western plains clearly demonstrate. We prevent our army horses from seeking shelter by confining them to picket lines; therefore it would be in the interest of economy to provide for them field stables, to prevent suffering, disease and losses by death. We realize that shelter cannot always be provided for horses during movements of troops, but this is a stationary camp, with plenty of lumber and canvas on hand or easily procurable.

*Decision.*—Well, there is no money available for that sort of thing!

Gradually the long, sub-tropical summer set in in Texas, and the horses on the picket lines commenced now to suffer from the exposure to the intense rays of the sun. Eye diseases and skin diseases appeared. It was about this time that the Humane Society of San Antonio appeared on the scene. They cautiously observed the horses on the picket lines and interrogated the army veterinarians as to the need of shelter. When they were assured that such would prevent suffering and disease they departed. Within twenty-four hours a respectable delegation waited on Major-General Carter, commanding the division, submitted a complaint of cruelty to animals from absence of shelter and made suggestions. Instead of objecting to the interference of these

"good and well-meaning people," as had previously been done by other army officers under similar circumstances, the general wisely concurred in their claims, reported the matter to the War Department, which immediately provided funds and ordered the building of wooden sheds for all animals in camp. Undoubtedly, this is a triumph for the righteous work of the humane society, as it is a new record of the Maneuver Division that will stand as an example for the future.

But why is it that such a reasonable betterment cannot be instituted by the recommendation from our own ranks, and why must we, in the army, submit only to outside influence in matters of this kind? It is the duty of the army veterinarian to look after the health of our animals, as it is the duty of the army surgeon to look after the health of the soldier. But the surgeon, being an officer of the Medical Corps, has authority to enforce his recommendations, whereas the veterinarian, without rank and without the backing of professional authority, is easily and with impunity turned aside or silenced by the dictum: "That's all, doctor." Never will our horses in the United States Army be looked after humanely or scientifically as are the horses of other civilized armies until we have a Veterinary Corps resembling theirs, and one whose officers have not only the training to know and the feeling of duty to recommend a modern hygienic care of horses, but also the authority to enforce such care.

O. S.

SECOND ANNUAL SPORTSMAN'S DINNER, Waldorf-Astoria, New York, February 19, marked great advance in the interest of the horse during the past year, and resulted in the organization of the "*U. S. Cavalry and Artillery Remount Association*," with Major-General Wood, U. S. A., as president. Mr. August Belmont, who presided at the dinner, referred to legislation against horse racing as discouraging the breeding of thoroughbreds in the United States.

GOVERNOR DIX FAVORS THE BREEDING OF CAVALRY HORSES IN NEW YORK STATE.—Through the *New York Press* we learn that on February 16 Governor Dix took up for consideration with Commissioner Calvin J. Huson the advisability of breeding in New York State horses suitable for the army, national guard and police department. Governor Dix is of the opinion that it is a matter that the New York State Department of Agriculture could take up to advantage. The REVIEW shares the Governor's opinion.

## CORRESPONDENCE.

MAGNOLIA, ARK., January 26, 1912.

Editors AMERICAN VETERINARY REVIEW, NEW YORK, N. Y.:

I would like to find out through the REVIEW whether any of the readers have any *specific* for cerebro-spinal meningitis of horses and mules or not? Also, called "blind staggers." In our section of the country (Southwest Arkansas) the disease, this fall and winter, has been something grave. In my county here, up to date, I know of about forty head of horses and mules that have died; last year was a wet year on corn, which caused the corn to smut or mold. The farmers in this country feed on corn exclusively as a grain ration. Fodder and pea vine hay as roughness. I have never known of a case where oats and hay (timothy or alfalfa) has been fed. Most every fall we have some cases of "staggers," but not so many as we have had this and last year. So long as the farmers feed moldy corn and moldy pea hay I believe we will have "staggers." I have been seeing these cases for twelve years, and very few that I have seen recovered. No specific bacterium, organism or virus has been isolated that is capable of demonstration as the causative agent of "staggers." I think it is a narcotic poison introduced from without, rather than a disease due to a germ propagated in the system; it is caused from molds or parasitic fungi that grow on plants and grain. I suppose everything in the materia medica has been tried, with no avail.

*Treatment:* Quinine and whiskey is the most popular remedy. Quinine 3i, whiskey Oi, and repeat in six hours. First of all give a brisk purgative and blister on the poll. Once in a while, one will happen to get over the attack with this kind of medication; but if an animal happens to make it through an attack, he is never of much use any more. They are left in a "flighty," nervous state all the time; liable to go crazy at any time, which shows it is a cerebral affection.

I am in hopes that the *Bureau of Animal Industry's* men will investigate this disease more thoroughly.

Report of two cases: Mr. P. owned both of them—a gray and a bay horse. Mr. P. went to feed in the morning and found his bay horse in the stall with his head jammed in the corner; tried to move him around, but wanted to turn to the left all the time; finally managed to get him out of the stall, still going to the left in a circle; intended taking him to town, about three miles, but died in sight of his residence. This one died in about twelve hours. The gray lived about twenty-four hours; history the same; only he got him into my hospital in town; he lived about forty-eight hours. These two animals had been eating the same kind of feed about the same length of time—which was ear corn and fodder that was moldy. I examined the corn and found it to be damaged with smut.

This disease is no new one. Some of the old settlers know it to be over fifty years in this country. It is also an expensive disease here in the South; several hundreds of dollars' loss every year.

O. W. COLLINS.

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BLACKSBURG, VA., February 17, 1912.

*To the Editor of the AMERICAN VETERINARY REVIEW:*

In the interesting report on a mule-footed hog by E. Jackson in the February REVIEW he advances the theory that the wattles on the hog's jaws were made artificially as a distinguishing mark or brand, such as is frequently found on cattle. I feel quite certain that the wattles described and illustrated in the cut are natural. I have seen a race of swine in Cuba all of which have these tassel-like wattles, and I am informed that hogs having this peculiar structure were quite common in former times in some of the Southern states. If I remember correctly, the breed of hogs that possessed these wattles were called by the Cubans "Gallegos," which would indicate that they came from the province of Galicia, in the north of Spain. These hogs were black in color, of a smooth, round, lard type, but small in size. There was also another breed of black, nearly hairless, hogs, much larger, that they called "Chinos," indicating that they were of Chinese origin, but I do not recall whether they had the wattles or not.

N. S. MAYO.

## SOCIETY MEETINGS.

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### COLORADO VETERINARY MEDICAL ASSOCIATION.

The annual meeting of this association was called to order by the President, Dr. Dickey, in the Gentlemen's Riding and Driving Club, Denver, Colo., January 18, 1912, at 1.30 p. m.

The following members and visiting veterinarians were present: Drs. Geo. W. Dickey, B. F. Kaupp, A. W. Whitehouse, J. F. Meinzer, I. E. Newsom, H. S. Eakins, H. E. Kingman, Geo. H. Glover, R. H. Bird, A. B. McCapes, A. G. Fisk, Percy Lamb, T. F. Quinn, M. J. Dunleavy, B. F. Davis, W. W. Yard, N. J. Miller, Chas. G. Lamb, M. J. Woodliffe and about 40 students of the Division of Veterinary Medicine of the State Agricultural College.

#### THE BUSINESS MEETING.

After the reading of the minutes of the previous meeting and the reading of a few letters by the secretary the following names were added to the membership roll: Drs. J. F. Meinzer, La Jara, and Rex Van Sickle, Las Animas.

The secretary-treasurer's report showed the treasury account in good condition.

The resolution committee, consisting of Drs. M. J. Dunleavy, T. F. Quinn and A. W. Whitehouse, made report on several resolutions which were adopted. The following are the resolutions:

Resolution No. 1: Resolved that we heartily endorse the Army Veterinary Service Bill (H. B. No. 16843) introduced by Mr. Difendorfer; we urge its favorable consideration on our Senator and Representatives, and call on our President to appoint a committee of three to assist its passage.

The following committee was appointed: Drs. Geo. H. Glover, R. H. Bird and Chas. G. Lamb, and president and secretary ex-officio.

Resolution No. 2: Resolved that we condemn the manufacture and sale of hog cholera serum by Mr. .... on the ground that we do not consider his scientific training

sufficient to warrant confidence in his ability to use proper methods. We instruct the honorable secretary to call the attention of the State Pure Food Commissioners and of the Bureau of Animal Industry to the same.

Resolution No. 3: Resolved that we hereby condemn the unauthorized tuberculin testing of cows by Mr. . . . . ., secretary of the State Dairy Association, and call attention of the State Board of Veterinary Examiners to take proper steps in the matter.

Resolution No. 4: Resolved that we favor legislation controlling the sale of tuberculin in the State of Colorado.

Resolution No. 5: Resolved that we favor a law similar to the one in Wisconsin which forbids the sale of cattle for breeding or dairy purposes that have reacted to the tuberculin test.

Resolution No. 6: Resolved that we hold that in default of definite legislation to the contrary the first duty of an attending veterinarian is to his client; and that we further

Resolve that until a law is passed calling for notification of certain scheduled contagious diseases and for a suitable fee for said notification, members of this association are not called on to notify the state veterinarian of any contagious or infectious diseases of live stock observed in general practice.

Resolution No. 7: Resolved that the Colorado Veterinary Medical Association subscribe \$5 (five dollars) towards the fund to erect a monument to the memory of the late Prof. S. Arloing.

Resolution No. 8: Resolved that we believe it to be against the best interests of the public and of the profession, as well as contrary to law, to allow the licensed non-graduate veterinarians to examine and certify stallions for soundness.

Resolution No. 9: Moved and carried that the president appoint a committee of three to confer with the Veterinary Section of the State Experiment Station and outline a plan for co-operation between the association and station for the studying of some one simple non-specific disease.

The president appointed the following committee: Dr. A. W. Whitehouse, A. P. Drew and A. G. Brocker.

The following officers were elected for the ensuing year:

President, Dr. M. J. Woodliffe, Denver, Colo.

First Vice-President, Dr. A. B. McCapes, Boulder, Colo.

Second Vice-President, Dr. I. E. Newsom, Ft. Collins, Colo.

Secretary-Treasurer, Dr. B. F. Kaupp, Ft. Collins, Colo.

Executive Committee, Drs. A. W. Whitehouse, T. F. Quinn and A. G. Fisk.

Drs. H. S. Eakins, Secretary of Wyoming Sheep Inspection Board, and B. F. Davis, State Veterinarian of Wyoming, were elected honorary members of the association.

The president appointed the following committee to work in conjunction with the Dairymen's Association and State tuberculosis committee on legislative matters pertaining to the control of tuberculosis among animals and men in the State of Colorado: Drs. Geo. H. Glover, Chas. G. Lamb and A. W. Whitehouse.

#### THE PAPERS.

"The Work of the Examining Board," by Dr. Geo. W. Dickey, President of the association.

"Necrobacillosis in Sheep,"\* by Dr. H. S. Eakins, Secretary Wyoming Sheep Board.

"Serums in Practice," by Dr. A. G. Fisk, Denver, Colo.

"Ovariectomy in Bitch," by Dr. H. E. Kingman, Professor of Surgery Division, Veterinary Medicine Colorado State Agricultural College.

"Infectious Equine Anemia," by Dr. W. S. Craig, Delta, Colo.

"Black Tongue in Dogs," by Dr. A. W. Whitehouse, Boulder, Colo.

"Glanders, Its Control and Eradication," by Dr. B. F. Davis, State Veterinarian of Wyoming.

"The Art of Diagnosis," by Dr. Geo. H. Glover, Division Veterinary Medicine, Colorado State Agricultural College.

#### THE CLINIC.

Case No. 1—Lavator humeri abscess. Operator, Dr. A. B. McCapes.

Case No. 2—Lameness. Diagnosed occult spavin.

Case No. 3—Spavin-point firing, by Dr. M. J. Woodliffe.

Case No. 4—Ovariectomy in bitch, demonstrating new method by Dr. H. E. Kingman.

Case No. 5—Enucleation of eye of bitch. Operator, Dr. A. G. Fisk.

Case No. 6—Tumor, superior maxilla of dog. Operator, Dr. A. G. Fisk.

\* Published in this month's issue of REVIEW, pages 789 to 793.

Case No. 7—Tumor of mammary gland of bitch. Operator, Dr. M. J. Woodliffe.

THE PATHOLOGICAL EXHIBIT.

*Tuberculosis group:* Tuberculosis, cow. Lung, prescapular lymph gland. Diaphragm, peritoneal surface. Liver.—Tuberculosis, hog. Lung, colic lymph glands. Liver. Mesenteric lymph glands. Ribs. Mediastinal lymph glands. Sublumbar lymph glands. Kidney. Heart.

*Parasitic group:* Coccidiosis, liver, cow. *Cysticercus tenuicollis*, omentum, sheep. *Taenia fimbriata*, gall ducts, liver, sheep. *Spiroptera strongylina*, stomach of hog (showing gastritis). *Echinorhynchus gigas*, small intestines, hog. *Strongylus paradoxus*, lung of pig. Ictero-hematuria, sheep. Carcass, spleen, liver, etc.

*Actinomycosis group:* Tongue, submaxillary lymph glands and head of cattle. Bone of cow. Ovine caseous lymph adenitis, mediastinal glands and lung (three cases), sheep. Pneumonia, cow showing also pleuritic exudate. Pneumonia in sheep, also in hog.

*Tumors:* Adeno-sarcoma, kidney, hog (three cases). Sarcoma mesentary, ox. Hydronephrosis, kidney, ox. Fibroplastic nephritis, kidney, pig. Papilloma, inner surface of rumen. Cirrhosis of the liver, pig. Emphysema, mesentary and small intestines, pig.

This collection was provided by Drs. Busman and Leeper and others.

The annual supper was held at the Standish Hotel.

The semi-annual meeting will be held in Ft. Collins, at the State Agricultural College, early in June.

B. F. KAUPP, Secretary.

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VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

The twenty-eighth annual meeting of this association was held at the Hotel Windsor, Trenton, N. J., on Thursday, January 11, 1912, with Dr. T. B. Rogers, president, in the chair. The following members were present: Drs. Magill, T. E. Smith, George W. Smith, J. B. Hopper, Bauldwin, Vander Roost, Har-

rison, McDonough, Harker, Conover, Jones, J. F. Glennon, Hurley Bar, T. B. Rogers, Carey, Ramsey, Sheriden, Stearns, Belloff, Dickson, Horner, Buckley, Churchill, Loblein, J. Payne Lowe and William Herbert Lowe—27 members. The visitors were: Dr. John Reichel, of Philadelphia; Dr. Reading, of the State Medical Society, and Dr. Shaffer (a recent graduate), of Newark, N. J.

Before reading the minutes of the July meeting, Dr. Lowe, secretary, reported that the original minutes of that meeting, together with other records and property of the association, were destroyed by fire while in the secretary's office on October 5 last. The secretary's minutes were approved as read.

Dr. J. B. Hopper gave a comprehensive report of the Toronto meeting of the A. V. M. A. The association was represented at Toronto by Drs. T. E. Smith, G. W. Smith, Runge, Vliet, T. B. Rogers and J. B. Hopper.

Dr. T. E. Smith reported on the New York State meeting, held in Brooklyn. Dr. Smith's remarks brought out many important measures considered by the New York State Society, and these proved of much interest to the members.

The reports of officers and committees were then received, and showed progress made along all lines. Several of the members reported conditions in different parts of the State regarding the testing of cattle under the new Tuberculosis Commission.

The president made his annual address, and rehearsed the activities of the society for the past year, laying particular stress on the work of the Legislative Committee, to which he gave just praise. He also suggested future efforts for legislation for the benefit of the profession and betterment of health conditions in the State.

The death of Dr. M. M. Stage, which occurred October 19, 1911, was reported to the society, and a memorial committee was appointed to take suitable action.

Several letters of regret from members unable to attend the meeting were read. Dr. J. Ellis Paulin reported himself a victim of sciatic rheumatism, and the society sent him a letter of condolence.

Dr. W. H. Lowe presented the following, which he recommended as an amendment to Chapter 18, Laws of 1902:

"The Veterinary Medical Association of New Jersey recommends to the Legislature that Chapter 18, Laws of 1902, be amended as follows: That any practitioner who shall make a fake or dishonest tuberculin test of a dairy animal or animals or

other cattle intended for breeding purposes, or who shall make a false report or certificate of a tuberculin test, shall forfeit his license or right to practice veterinary medicine in the State of New Jersey. The State Board of Veterinary Medical Examiners is hereby authorized and empowered to revoke or annul the license or order the cancellation of the registration of any practitioner of the State found guilty of such offense."

Another resolution was moved and carried, as follows:

"That the law be so amended as to require all veterinarians making tuberculin tests of State cattle to report all reactors to the Commission of Tuberculosis in Animals, so that the commission might place a permanent mark or brand on such animals."

The purpose being to protect the public from having tested tuberculous cows unloaded on them.

Upon motion, the proposed amendment was adopted by the association and referred to the Committee on Legislation.

Dr. J. Payne Lowe addressed the association on the proposed army veterinary legislation, and upon his motion the bill now before Congress to improve the efficiency of the service in the United States Army was indorsed (House Bill 16843). The secretary was also ordered to notify Dr. Hoskins, representing the American Veterinary Medical Association, of the indorsement of this bill by the society.

On motion of Dr. J. B. Hopper, it was resolved to request the Tuberculosis Commission to stop the practice of sending tags out of the State.

Dr. John Reichel gave a long address on subjects of vital interest. His first subject was "The Serum Treatment for Hogs Exposed to Hog Cholera Infection," which he spoke of in an exhaustive manner. He then took up the subject of "The Cause of Parturient Paresis," and detailed the work of German scientists along this line.

A lengthy and profitable discussion followed. The society tendered Dr. Reichel a vote of thanks for his efforts.

Dr. Reading made some interesting remarks regarding the activity of the society along legislative lines, and congratulated the members on their efforts to secure better laws on animal industry.

The rest of the meeting was taken up with routine business and the election of officers for the following year, which resulted as follows:

President—Dr. T. E. Smith, Jersey City.

First Vice-President—Dr. J. T. Glennon, Newark.

Second Vice-President—Dr. J. Payne Lowe, Passaic.

Treasurer—Dr. James McDonnough, Montclair.

Secretary—Dr. E. L. Loblein, New Brunswick.

It was decided to hold the semi-annual meeting of the society in July at Jersey City, and the following committee has been appointed to arrange for the meeting:

Drs. R. R. Ramsay (chairman), R. J. Halliday, R. F. Churchill, George W. Smith, E. Matthews, James L. Lindsay and R. W. A. English.

E. L. LOBLEIN, Secretary.

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#### VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY.

The regular meeting of this association was called to order by the vice-president, Dr. R. H. Kingston, at 8.45 p. m.

The minutes of the January meeting were read and approved.

Dr. D. W. Cochran then read an exceptionally interesting and instructive paper, entitled "A Winter Disease." In this paper the doctor dealt with the conditions commonly known as "scratches" and the different complications which attend this condition. He very fully described the etiology and pathology of the different forms of this trouble that we meet with in our practice. In fact, he covered the ground so thoroughly on this subject that it left little or nothing to be added.

This paper was productive of a very interesting discussion by a majority of the members present.

Dr. R. W. Ellis mentioned one case of a coach horse that had an attack of scratches and when nearly healed was taken out during a snowstorm, with the result that the leg swelled up and opened just above the fetlock. Six weeks later, when again seen, a tumor weighing ten pounds and having the appearance and consistency of hard white rubber had developed. This was removed with quite some difficulty, owing to the nature of the growth. A return of the same occurred, when it was again excised and thoroughly cauterized, resulting in complete recovery.

Drs. Clayton, Blair, Schlessinger, Nichols and others cited cases under this heading which had come to their notice.

Dr. Cochran then gave an interesting account of the recent Veterinary Conference at Ithaca, which he attended.

The doctor stated that hog cholera was discussed fully at this

conference. This led to quite a lengthy discussion on hog cholera, in which Drs. Nichols and Chase took an active part.

Dr. Chase gave an interesting history of an outbreak of hog cholera on Long Island in a herd of 76 head. Nine deaths had occurred, and all of the remaining hogs were inoculated; about 40 more deaths took place. Those remaining were inoculated the second time, but with poor results. In this instance Dr. Chase stated that a mixed infection was suspected.

Dr. R. W. Ellis then presented a dog for examination and diagnosis, and stated that this animal had had a discharge from the sheath of the penis for quite some time, also an affection of the eyes. The owner was alarmed, suspecting that the animal was suffering from a contagious venereal disease.

Dr. Blair gave it as his opinion that it was a case of chronic conjunctivitis, with a granular inflammation of the glans penis. Advised the complete excision of the membrane nictitans, arsenic internally and a solution of zinc sulphate externally.

Dr. Kingston cited a case of suspected syphilis in a dog in which the history pointed very strongly to this condition, although it was not conclusively proven to be such.

Dr. Clayton, chairman of the Smoker Committee, reported that the "Smoker" was a great success, and that all bills had been paid.

On motion regularly made, seconded and carried, the committee was discharged with a vote of thanks.

A letter from Dr. L. A. Merillat, secretary of the Illinois State Veterinary Medical Association, regarding the army bill, was read, and on motion ordered received and the secretary instructed to answer the same, stating that this association has also indorsed this bill.

Dr. C. E. Clayton moved that the motion to hold the March meeting of this association in Brooklyn, adopted at the January meeting, be rescinded and the meeting held in the New York-American Veterinary College, as usual. Seconded and carried.

Dr. Clayton stated that he expected Dr. A. Eichhorn, of the Bureau of Animal Industry, Washington, D. C., to address this association at the March meeting on the diagnosis of glanders by complement-fixation.

Dr. Ellis stated that he would suggest inviting Dr. Meyers, of Philadelphia, to discuss Dr. Eichhorn's paper. Dr. Ellis was requested to write Dr. Meyers and invite him to attend the next meeting.

Meeting adjourned.

R. S. MACKELLAR, Secretary.

## WISCONSIN SOCIETY OF VETERINARY GRADUATES.

CITY HALL, MADISON, WIS., January 23, 1912.

Meeting called to order by President Furgeson. Address of welcome by Mayor Schubert. Response by Dr. R. S. Heer. Address by President Furgeson. Roll call found a large number of members present. Minutes of the previous meeting read and adopted. Reports of secretary and treasurer read and accepted. Chairmen of the various committees reported for the same. Seven applications for membership were favorably acted on by Board of Censors and accepted members by the society. On motion by Dr. Clark, and seconded by Dr. Crane, it was unanimously voted that the society accept the resignation of Charles Schmith, of Dodgeville, and R. S. Mitchell, of Manitowoc. The society elected as its officers for the ensuing year: President, B. F. Holmes, of Lacrosse; vice-president, F. A. Wilson, of Green Bay; secretary, J. P. West, of Madison; treasurer, J. F. Roub, of Monroe. Dr. F. B. Hadley was elected delegate to the next annual meeting of the American Veterinary Medical Association, to be held at Indianapolis, Ind. Dr. L. A. Wright, delegate to last annual meeting of American Veterinary Medical Association, held at Toronto, gave a very interesting report. Dr. O. H. Elliason, State Veterinarian, favored the society with an address. Regular adjournment, to meet at 7.30 p. m.

City Hall, 7.30 p. m.—Meeting called to order by President Holmes. Dr. A. N. Lawton read an excellent paper on "Peritonitis and Impaction in the Latter Stages in the Mare." R. E. Katz, secretary of the Livestock Sanitary Board, related the recent rulings of that department. Dr. F. A. Wilson gave a very complete report of the cases operated at the semi-annual meeting. Dr. R. S. Heer's paper, subject, "Prolapse of the Vagina." Dr. W. R. Swan, paper, "Purpura-Hæmorrhagica." Regular adjournment, to meet at West's Infirmary the following morning.

West's Infirmary, January 24, 8.30 a. m.—Members of the society interested themselves with clinical material during the entire forenoon. 12 p. m.—Adjourned, to meet at City Hall, 1.30 p. m.

City Hall, 1.30 p. m.—Meeting called to order by President Holmes. Society voted to hold next semi-annual meeting at Janesville. Dr. J. F. Kennedy's paper "Polipi." Dr. G. H. Harlad, subject, "What is the Sidebone?" Dr. J. C. Howes, "Influenza and Its Sequels." Dr. F. B. Hadley, subject, "Recent Methods of Diagnosing Glanders." Adjourned, to meet at banquet at Capital House, 7.30 p. m.

7.30 p. m.—Three hours were enjoyably spent by the society, with Dr. H. D. Pattison as toastmaster.

West's Infirmary, January 25, 8 a. m.—The members were entertained with clinical material throughout the day. Dr. F. A. Merillat, of Chicago, was present and demonstrated many recent operations. Patients were immunized with antitoxin, furnished through the kindness of the Mulford Company. Drs. Hadley and Beech gave a hog-cholera vaccination demonstration.

4.30 p. m.—Meeting called to order. Society extended Dr. Merillat a vote of thanks for his services and interest shown in their behalf during the meeting. Regular adjournment, to meet at the semi-annual convention.

J. P. WEST, Secretary.

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#### SOCIETY OF COMPARATIVE MEDICINE, NEW YORK STATE VETERINARY COLLEGE.

The Society of Comparative Medicine gave its ninth annual banquet January 11, 1912. The banquet took place at the close of the fourth Annual Conference for Veterinarians, held at the New York State Veterinary College, January 10 and 11. A great many of the alumni of the college were present at the conference and co-operated very willingly with the society in giving the banquet. One hundred and twenty-three places were occupied at the tables in the large dining-room of the New Ithaca Hotel by members of the Veterinary College faculty, alumni, veterinary student members of the society and guests. Music was furnished, and a very sumptuous supper of six courses was served. Dr. V. A. Moore, director of the college, officiated very ably and most pleasingly as toastmaster of the evening. The following was the official program of the evening:

Mr. O. B. Webber, President of the Society—Address of Welcome. President J. G. Schurman—"The Veterinary College and the University." Dr. Jno. W. Adams, Veterinary Department, University of Pennsylvania—"The Veterinarian Himself, His Reputation and Success." Dr. J. G. Wills, State Veterinarian—"Veterinarians and the State." Professor A. W. Browne, Professor of Chemistry, Cornell University—"Arts and Science for the Veterinarian." Professor Chas. H. Tuck, New York State College of Agriculture—"The Veterinarian and the Farmer." Dr. Cassius Way—"The Alumni." Dr. D. H. Udall, Professor of Veterinary Medicine—"The Faculty."



# VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table the data given is reported by many Secretaries as being of great value to their Associations, and it is to be regretted that some neglect to inform us of the dates and places of their meetings.

Secretaries are earnestly requested to see that their organizations are properly included in the following list :

Name of Organization.	Date of Next Meeting.	Place of Meeting.	Name and Address Secretary
Alumni Ass'n, N. Y.-A. V. C.....	Week Aug. 26,'12	141 W. 54th St. Indianapolis..	J. F. Carey, East Orange, N. J.
American V. M. Ass'n.....	1st and 3d Thur. of each month	Lec. Room Laval Un'y, Mon.	C. J. Marshall, Philadelphia.
Arkansas Veterinary Ass'n.....	2d Fri. ea. mo.	Chicago.....	J. B. Arthur, Russellville.
Ass'n Médéciale Veterinaire Française "Laval".....	3d Mon. ea. mo.	S. Omaha, Neb	J. P. A. Houde, Montreal.
B. A. I. Vet. In. A., Chicago.....	June and Nov.	San Francisco.	H. A. Smith, Chicago, Ill.
B. A. I. Vet. In. A., So. Omaha.....	2d Tues. ea. mo	Ottawa.....	S. Jackson, So. Omaha.
California State V. M. Ass'n.....	June, 1912.....	Syracuse.....	J. J. Hogarty, Oakland.
Central Canada V. Ass'n.....	Feb. 6, 1912.....	Chicago.....	A. E. James, Ottawa.
Central N. Y. Vet. Med. Ass'n.....	3d Mon. ea. mo.	Ft. Collins....	W. B. Switzer, Oswego.
Chicago Veterinary Society.....	Dec. 21-22, 1911.	Hartford.....	D. M. Campbell Chicago.
Colorado State V. M. Ass'n.....	2d Sat. ea. mo.	Newark, N. J.	B. F. Kaupp, Ft. Collins.
Connecticut V. M. Ass'n.....	Oct. 10-12, 1911.	Atlanta.....	B. K. Dow, Willimantic.
Essex Co. (N. J.) V. M. A.....	July, 1912.....	Wash., D. C.	J. F. Carey, East Orange, N. J.
Genesee Valley V. M. Ass'n.....	Jan. 10-11, 1912.	Boise.....	J. H. Taylor, Henrietta.
Georgia State V. M. A.....	January, 1913.....	Springfield...	P. F. Bahnsen, Americus.
V. M. A. of Geo. Wash. Un'y.....	Oct. & Feb. ea. yr.	Indianapolis..	A. T. Ayers.
Hamilton Co. (Ohio) V. A.....	January, 1912.....	Louis P. Cook, Cincinnati.	G. E. Noble, Boise.
Idaho Ass'n of Vet. Graduates.....	Monthly.....	L. A. Merillat, Chicago.	E. M. Bronson, Hartford City.
Illinois State V. M. Ass'n.....	Feb. 6-8, 1912.....	C. H. Stange, Ames.	J. H. Burt, Manhattan.
Indiana Veterinary Association.....	Jan. 10-12, 1912.	Robert Graham, Lexington.	E. H. Yunker, Phila.
Iowa Veterinary Ass'n.....	Jan. 16-17, 1912.	E. P. Flower, Baton Rouge.	C. W. Watson, Brunswick.
Kansas State V. M. Ass'n.....	Annually.....	H. H. Counselman, Sec'y.	J. H. Seale, Salem.
Kentucky V. M. Ass'n.....	Dec. 14-15, 1911.	Judson Black, Richmond.	G. Ed. Leech, Winona.
Keystone V. M. Ass'n.....	April, 1912.....	Wm. P. Ferguson, Grenada.	Hal. C. Simpson, Denison, Ia.
Louisiana State V. M. Ass'n.....	March, 1912.....	D. L. Luckey.	A. D. Knowles, Livingston.
Maine Vet. Med. Ass'n.....	Call of President	Bozeman.....	W. H. Tuck, Weeping Water.
Maryland State Vet. Society.....	4th Tues. ea. mo.	Lincoln.....	H. J. Milks, Ithaca, N. Y.
Massachusetts Vet. Ass'n.....	Mon. and Que.	Utica.....	M. J. Ragland, Salisbury.
Michigan State V. M. Ass'n.....	Jan. and June..	C. H. Babcock, New Rockford.	A. J. Kline, Wauseon.
Minnesota State V. M. Ass'n.....	Jan. 2-3, 1912.....	O. V. Brumley, Columbus.	F. F. Sheets, Van Wert, Ohio.
Mississippi State V. M. Ass'n.....	1st Wed. fol. the	J. C. Howard, Sullivan.	C. E. Steel, Oklahoma City.
Missouri Valley V. Ass'n.....	2d Sun. ea. mo.	C. H. Sweetapple, Toronto.	John Reichel, Glenolden.
Missouri Vet. Med. Ass'n.....	Dec. 20, 1911.....	David C. Kretzer, Manila.	Sam. B. Foster, Portland, Ore.
Montana State V. M. A.....	2d Tues. July '12	Gustave Boyer, Rigaud, P. Q.	J. S. Pollard, Providence.
Nebraska V. M. Ass'n.....	Jan. Apl. Jy. Oct.	Clarence E. Smith, Greenville	F. Hockman, Louisville.
New York S. V. M. Soc'y.....	4th Tues. ea. mo.	Wm. T. Conway, St. Louis, Mo.	W. G. Huyett, Wernersville.
North Carolina V. M. Ass'n.....	Mar. 18 19, 1912.	B. T. Woodward, Wash'n, D. C.	S. W. Allen, Watertown.
North Dakota V. M. Ass'n.....	2d Thu. ea. mo.	J. A. Dell, Los Angeles.	H. R. Collins, So. St. Joseph.
North-Western Ohio V. M. A.....	Mar., 1912.....	A. C. Topmiller, Murfreesboro	R. P. Marsteller, College Sta
Ohio State V. M. Ass'n.....	Mar., 1912.....	S. H. Ward, St. Paul, Minn.	A. J. Webb, Layton.
Ohio Soc. of Comparative Med..	3d Wed. ea. mo.	G. T. Stevenson, Burlington.	C. H. H. Sweetapple, For.
Ohio Valley Vet. Med. Ass'n.....	Not stated.....	Saskatchewan, Alta., Can.	M. Page Smith, Wash., D. C.
Oklahoma V. M. Ass'n.....	July, 1912.....	F. Torrance, Winnipeg.	E. L. Loblein, New Brunswick.
Ontario Vet. Ass'n.....	1st Wed. ea. mo.	R. S. MacKellar, N. Y. City.	A. F. Mount, Jersey City.
Pennsylvania State V. M. A.....	Monthly.....	W. G. Chrisman, Raleigh.	R. J. Donohue, Pullman.
Philippine V. M. A.....	1st & 3d Fri. Eve.	Carl Cozier, Bellingham.	Benjamin Gunner, Sewickley.
Portland Vet. Med. Ass'n.....	Jan. 9-10, 1913.	J. P. West, Madison.	E. S. Bausticker, York, Pa.
Province of Quebec V. M. A.....	3d Thurs. ea. mo.		
Rhode Island V. M. Ass'n.....	July, 1912.....		
South Carolina Ass'n of Veter'n's	1st Tue. Mar. '12		
So. Illinois V. M. and Surg. A.....			
St. Louis Soc. of Vet. Inspectors.			
Schuykill Valley V. M. A.....			
Soc. Vet. Alumni Univ. Penn.....			
South Dakota V. M. A.....			
Southern Auxiliary of California State V. M. Ass'n.....			
So. St. Joseph Ass'n of Vet. Insp.			
Tennessee Vet. Med. Ass'n.....			
Texas V. M. Ass'n.....			
Twin City V. M. Ass'n.....			
Utah Vet. Med. Ass'n.....			
Vermont Vet. Med. Ass'n.....			
Veterinary Ass'n of Alberta.....			
Vet. Ass'n Dist. of Columbia.....			
Vet. Ass'n of Manitoba.....			
Vet. Med. Ass'n of N. J.....			
V. M. Ass'n, New York City.....			
Veterinary Practitioners' Club.....			
Virginia State V. M. Ass'n.....			
Washington State Col. V. M. A.....			
Washington State V. M. A.....			
Western Penn. V. M. Ass'n.....			
Wisconsin Soc. Vet. Grad.....			
York Co. (Pa.) V. M. A.....			

## PUBLISHERS' DEPARTMENT.

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MARCH COUGHS are persistent and must be dealt with promptly and scientifically. Have you studied the formula of Parke, Davis & Co.'s EQUINE COUGH SYRUP on page 4 (adv. dept.) in February REVIEW? The same space is occupied by Bacterial Vaccines in the present number.

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AFTER a long winter horses require plenty of nourishing food. The prevention of purpura is easier than its treatment, and better for the horse. Among the nourishing foods ATLAS HORSE FEED holds a prominent place. See the address on page 3 (adv. dept.). Mention the REVIEW when you write.

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